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### CITATION

Collins, Anne M.; Connaughton, James; Hill, Arnold DK; Ridgway, Paul F. (2013): Bare Below the Elbows: A comparative study of a tertiary and district general hospital.. Royal College of Surgeons in Ireland. Journal contribution. <https://hdl.handle.net/10779/rcsi.10801208.v1>

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# **Bare Below the Elbows: A Comparative Study of a Tertiary and District General Hospital**

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Ir Med J. 2013 Oct;106(9):272-5

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## **Abstract**

A 'Bare Below the Elbows' (BBTE) dress code policy has been introduced by the majority of NHS trusts in the UK. The aim of this Irish study was to evaluate the impact of an educational intervention on perception of medical attire. The study was carried out in two centres: a tertiary referral centre (Beaumont Hospital) and a district hospital (MRH, Portlaoise). Two questionnaires, incorporating photographic evaluation of appropriate attire for consultants and junior doctors, were completed pre and post BBTE education. One hundred and five patients participated. Analysis pre BBTE education indicated patients considered formal attire and white coats most appropriate for consultants and junior doctors respectively. Post-intervention analysis revealed a significant reduction in the popularity of both ( $p < 0.001$ ), with scrubs and smart casual attire gaining significant support in both cohorts ( $p < 0.001$ ). Our findings demonstrated that patient opinion on medical attire is malleable. The support of such a policy may be achieved if patients are informed that the aim is to reduce the spread of healthcare-associated infections.

## **Introduction**

The hands of healthcare workers are frequently implicated in the transmission of healthcare-associated infections (HAIs).<sup>1</sup> The reported prevalence in inpatients is 4.9% in Ireland, 8.19% in England and 5% in the United States respectively, resulting in significant clinical and economic costs.<sup>2-5</sup> In an attempt to reduce HAI infection rates in the UK, the Department of Health devised guidelines for developing dress codes for healthcare professionals.<sup>6</sup> In addition to potentially reducing bacterial transfer from clothing and jewellery, it was proposed that adopting a 'bare below the elbows' (BBTE) policy would improve hand hygiene by enabling more effective hand washing. Following implementation in England, similar strategies were introduced in Scotland and in Northern Ireland.<sup>7,8</sup> The BBTE policy advocates the wearing of short-sleeves and advises against white coats, neck-ties and jewellery.<sup>6</sup> The isolation of pathogens from the white coats, ties and wristwatches of healthcare workers is well documented, but without conclusive evidence linking such contamination with the spread of HAIs.<sup>9-11</sup>

And while it is acknowledged that hand hygiene is the most effective strategy for controlling the spread of HAIs,<sup>12</sup> it is also acknowledged that being BBTE may not affect the quality of hand washing.<sup>13</sup> The importance of a doctor's attire is acknowledged in the literature.<sup>14,15</sup> In addition to the association between appearance and the perception of competence, appropriate apparel also plays a role in promoting professionalism.<sup>15</sup> Concerns have been raised, therefore, regarding the effects of being BBTE on patient confidence.<sup>14</sup> Conversely, it has been reported that a BBTE-type policy would be supported if patients are informed it could reduce the spread of HAIs.<sup>16,17</sup> Furthermore, changing doctors' attire to comply with departmental recommendations does not jeopardise first impressions, which play a vital role in the development of the doctor-patient relationship.<sup>18</sup> The aims of the study included evaluation of the uninformed attitudes of Irish patients on the appropriateness of specific apparel for consultants and junior doctors, and the subsequent impact of an educational intervention.

## **Methods**

A cross-sectional study was carried out in two centres: Beaumont hospital, a University-affiliated, tertiary referral centre, and the Midland Regional hospital, a district general hospital in Portlaoise. Two centres were included to identify any discrepancies between urban (Beaumont) and rural (Portlaoise) opinion. The modus operandi of the study was approved by the research ethics committee. Consecutive samples of inpatients at specific time points were studied. Two bespoke study-specific questionnaires were designed, incorporating patient demographics in addition to photographic evaluation of appropriate attire for consultants and junior doctors. Although the BBTE guidelines apply to all healthcare workers, doctors were specifically selected as the study subjects. They are a highly visible sub-group of healthcare workers on the front line of the health service. Unlike other healthcare workers, doctors currently do not wear a uniform in either of the study centres. Furthermore, a single sub-group was preferable, as multiple subgroups may have overcomplicated the study unnecessarily. A series of five standardised headless photographs were produced, consisting of a male model dressed in

differing attire. The options ranged from formal, semi-formal and smart casual, to the traditional doctor's white coat and surgical scrubs (Figure 1).

Participants were asked to rank the appropriateness of the attire using a five-point Likert scale (Likert 1932), where a score of 1 was indicative of the most appropriate attire and 5 was indicative of the least appropriate choice. In order to reduce bias, the same model was used throughout the series. A female model was not included in the series to eliminate possible gender bias. The second component involved elucidating patient opinion on the appropriateness of a selection of items of jewellery. Following completion of the first questionnaire, participants were presented with a second questionnaire beginning with the statement: "In the UK, the Department of Health have made recommendations regarding a suitable dress code for hospital workers. The 'Bare Below the Elbows' policy advises against wearing white coats, long sleeves, ties, watches and jewellery, due to the risk of contamination by bacteria. The aim of this policy is to reduce the spread of hospital infections including MRSA. There is no definite proof that contaminated clothes are related to the spread of infection".

The final sentence is derived from the departmental publication which states "There is no conclusive evidence that uniforms (or other work clothes) pose a significant hazard in terms of spreading infection".<sup>6</sup> Study participants were invited to clarify any details necessary to ensure a basic understanding of the policy. They were subsequently asked to re-evaluate the series of photographs and once again rate the appropriateness of the attire in the same manner as described previously. The appropriateness of the jewellery items was also re-assessed. Meticulous care was taken to ensure standardisation between the centres. The questionnaires were distributed in an identical manner and were completed unsupervised to reduce the risk of verbal and non-verbal queuing. No additional information was provided that could have influenced the decision-making process. In addition, none of the participants were aware of the existence of the policy prior to intervention. Data was tested for normality using Shapiro-Wilk tests. Non-parametric analysis was used. Wilcoxin-Signed Ranks (WSR) and Mann-Whitney U (MWU) tests were used to compare dress code ratings pre and post BBTE education. p values, where appropriate, were taken to be significant at 0.05. All statistics were calculated using the Statistical Package for Social Sciences (IBM SPSS Statistics version 21).

## Results

### *Patient demographics*

One hundred and five patients agreed to participate, 53 in the urban centre and 52 in the rural centre. The questionnaires of six participants were excluded from analysis due to incomplete information. No significant differences, in terms of gender distribution or age, were demonstrated between the centres.



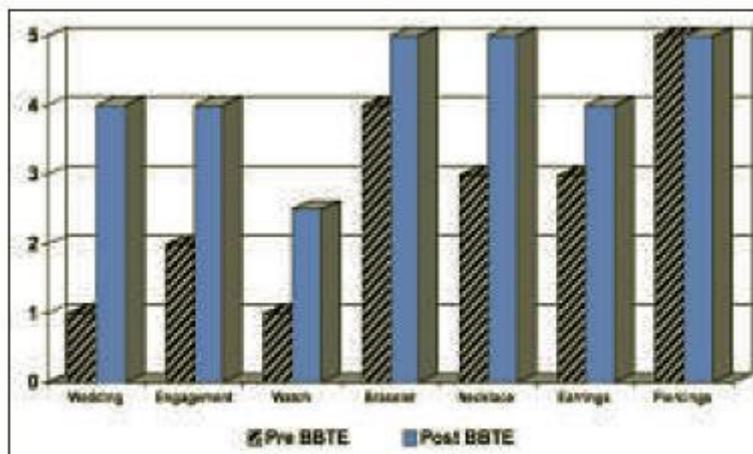
**Figure 1** Standardised series of five photographs featuring the white coat, semi-formal attire, formal attire, scrubs and smart casual attire.

Table 1 Median dresscode ratings pre and post BBTE education					
Urban Centre	White Coat	Semi-formal (Shirt & Tie)	Formal (Suit)	Scrubs	Smart Casual (Short Sleeves)
<b>Consultant</b>					
Pre Education	3	3	1	4	5
Post Education	3	3	3	3.5	3
Difference	0	0	2	0.5	2
p WSR (2-tailed)	0.142	0.076	<0.001*	<0.001*	<0.001*
<b>Junior Doctor</b>					
Pre Education	2	3	5	2	4
Post Education	4	4	5	2	2.5
Difference	2	1	0	0	1.5
p WSR (2-tailed)	<0.001*	0.038*	0.162	0.424	<0.001*
Rural Centre	White Coat	Semi-formal (Shirt & Tie)	Formal (Suit)	Scrubs	Smart Casual (Short Sleeves)
<b>Consultant</b>					
Pre Education	2	3	1	4	4
Post Education	4	3	5	2	1
Difference	2	0	4	2	3
p WSR (2-tailed)	<0.001*	0.09	<0.001*	<0.001*	<0.001*
<b>Junior Doctor</b>					
Pre Education	2	3	5	2	4
Post Education	4	4	5	1	2
Difference	2	1	0	1	2
p WSR (2-tailed)	<0.001*	<0.001*	0.34	<0.001*	<0.001*
Combined Analysis (Urban & Rural Centre)	White Coat	Semi-formal (Shirt & Tie)	Formal (Suit)	Scrubs	Smart Casual (Short Sleeves)
<b>Consultant</b>					
Pre Education	2	3	1	4	5
Post Education	3	3	4	2	2
Difference	1	0	3	2	3
p MWU (2-tailed)	0.000*	0.264	0.000*	0.000*	0.000*
<b>Junior Doctor</b>					
Pre Education	1	3	5	2	4
Post Education	3	4	5	2	2
Difference	2	1	0	0	2
p MWU (2-tailed)	0.000*	0.000*	0.472	0.082	0.000*

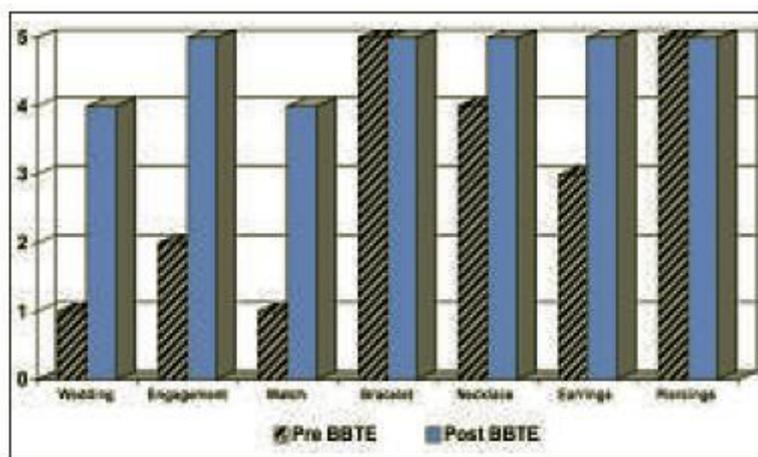
A five-point scoring scale was used where 1= most appropriate, 3= neutral and 5= most inappropriate. WSR = Wilcoxon-Signed Ranks test. MWU = Mann-Whitney U test. \*Significance is at the 0.05 level.

#### Patient attitudes pre BBTE education

Prior to intervention, consultant ratings indicated participants in the urban centre regarded formal attire as the most appropriate choice. Both scrubs and the smart casual look were deemed inappropriate. Concerning junior doctors, the median ratings for the white coat and for scrubs indicated both were considered appropriate (Table I). Regarding jewellery, patients deemed wedding rings, engagement rings and watches appropriate apparel for doctors in the workplace (Figure 2). In the rural centre, formal attire was considered most appropriate for consultants prior to BBTE education. The white coat was also deemed appropriate. The lowest median ratings were awarded to scrubs and the smart casual option respectively. With regard to junior doctors, the highest median ratings were awarded to the white coat and scrubs indicating both were considered appropriate (Table I). Analysis of jewellery scores revealed results comparable with those in the urban centre, with wedding rings, engagement rings and watches regarded as appropriate for the workplace (Figure 3).



**Figure 2** Median jewellery ratings in the urban centre pre and post BBTE education. A rating of 1 indicates the item is considered appropriate for the workplace, 2: reasonably appropriate, 3: neutral, 4: somewhat inappropriate, 5: very inappropriate.



**Figure 3** Median Jewellery ratings in the rural centre pre and post BBTE education. A rating of 1 indicates the item is considered appropriate for the workplace, 2: reasonably appropriate, 3: neutral, 4: somewhat inappropriate, 5: very inappropriate.

#### *Patient attitudes post BBTE education*

Analysis of consultant scores in the urban centre revealed a significant reduction in the popularity of formal attire ( $p < 0.001$ , WSR, Table I). In contrast, significant increases were recorded in the median ratings for both scrubs and the smart casual option respectively ( $p < 0.001$ ,  $< 0.001$ , WSR, Table I). Regarding junior doctors, the results demonstrated significant reductions in the popularity of the white coat and the semi-formal option ( $p < 0.001$ ,  $0.038$ , Table I). Conversely, an increase in the median rating for the smart casual option was noted ( $p < 0.001$ , Table I). Concerning jewellery, only wedding rings and watches were deemed appropriate following BBTE education (Figure 2). In the rural centre, consultant ratings indicated participants regarded formal attire as the least appropriate choice following intervention ( $p < 0.001$ , WSR, Table I). A significant reduction in the median rating for the white coat was also noted ( $p < 0.001$ , WSR, Table I).

In contrast, the increased median ratings for scrubs and the smart casual look indicated both were considered appropriate attire for consultants ( $p < 0.001$ ,  $< 0.001$ , WSR, Table I). Regarding junior doctors, analysis revealed significant reductions in the median ratings for the white coat and semi-formal options ( $p < 0.001$ ,  $< 0.001$ , WSR, Table I), thus neither were considered appropriate. In comparison, both scrubs and the smart casual look gained significant support ( $p < 0.000$ ,  $< 0.000$ , WSR, Table I). Analysis of jewellery ratings indicated none of the items evaluated were deemed appropriate following BBTE education (Figure 3).

#### *Combined Analysis: Urban and Rural Centres*

Prior to intervention, combined analysis indicated participants regarded formal attire as the most appropriate choice for consultants. Both scrubs and the smart casual look were deemed inappropriate. Concerning junior doctors, the median ratings for the white coat and for scrubs indicated both were considered appropriate (Table I). Evaluation of consultant scores following BBTE education revealed a significant reduction in the popularity of formal attire ( $p = 0.000$ , MWU, Table I). In contrast, significant increases in the median ratings for both scrubs and the smart casual option were recorded ( $p = 0.000$ , MWU, Table I). With regard to junior doctors, the results demonstrated significant reductions in the popularity of the white coat and the semi-formal option respectively ( $p = 0.000$ , MWU, Table I). Conversely, an increase in the median rating for the smart casual option was noted ( $p = 0.000$ , MWU, Table I).

#### **Discussion**

A doctor's competence and professionalism is often judged on the basis of attire.<sup>15</sup> Professional dress is significantly associated with trust and confidence-building during the patient encounter.<sup>19</sup> The BBTE guidelines advocate adopting a casual dress code in the workplace. They also somewhat paradoxically suggest healthcare workers should 'dress in a manner likely to inspire public confidence.'<sup>6</sup> Concerns have been raised, therefore, regarding the effects of adopting a casual dress code on patient confidence, and on confidence in the health service. Analysis of suitable attire for junior doctors prior to BBTE education revealed scrubs were considered appropriate in both centres. This perception may be influenced by contemporary television medical programming, such as *Grey's Anatomy* and *Scrubs*.

Following BBTE education, scrubs maintained their reputation as an appropriate choice for junior

doctors. Interestingly, analysis of consultant ratings revealed a significant increase in the popularity of scrubs in both centres. In the rural centre in particular, they were deemed appropriate attire for hospital consultants. The diminished popularity of the white coat in both centres following the educational intervention is interesting. The iconic white coat has epitomized the medical profession for over 100 years.<sup>20</sup> In the hospital setting, white coat-wearing inspires confidence in patients, and improves all aspects of the doctor-patient interaction.<sup>21,22</sup> Patients feel doctors are more professional when wearing white coats.<sup>22</sup> On the other hand, when informed of the risk of contamination, patient preference may change in favour of a dress code which could potentially lower the infection risk.<sup>18</sup> Our results support this finding.

It has previously been reported that patient opinion regarding the BBTE policy is malleable, and that patients are not averse to change.<sup>17</sup> The support of such a policy may be achieved in Ireland and elsewhere, if patients are informed that the aim is to reduce the spread of HAIs. In order to achieve widespread support, our recommendations would include the delivery of a more comprehensive educational package and the consideration of patient preference, given differing regional informed opinions. Further study is warranted.

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### **Acknowledgements**

N Moran and R Fenton for their assistance with the questionnaires and to C Kelly for modelling.

### **References**

1. Macdonald DJ, McKillop EC, Trotter S, Gray AJ. One plunge or two? hand disinfection with alcohol gel. *Int J Qual Health Care* 2006. 18: 120-122.
2. Fitzpatrick F, McIlvenny G, Oza A, Newcombe RG, Humphreys H, Cunney R, et al. Hospital infection society prevalence survey of Healthcare Associated Infection 2006: comparison of results between Northern Ireland and the Republic of Ireland. *J Hosp Infect* 2008. 69: 265-273.
3. Hospital Infection Society ICNA. The third prevalence survey of healthcare associated infections in acute hospitals in England 2006. London: Hospital Infection Society; 2007.
4. Wenzel RP, Edmond MB. The impact of hospital-acquired bloodstream infections. *Emerg Infect Dis* 2001. 7: 174-177.
5. Eber MR, Laxminarayan R, Perencevich EN, Malani A. Clinical and economic outcomes attributable to health care-associated sepsis and pneumonia. *Arch Intern Med* 2010. 170: 347-353.
6. Department of Health. Uniforms and Workwear: An evidence base for developing local policy. London: DoH; 2007.
7. Scottish Government Health Directorates. NHS Scotland Dress Code. Edinburgh: SGHD; 2008.
8. Department of Health Social Services and Public Safety. Regional dress code policy and recommendations on staff changing facilities for Northern Ireland. Belfast: Department of Health, Social Services and Public Safety; 2007.
9. Treakle AM, Thom KA, Furuno JP, Strauss SM, Harris AD, Perencevich EN. Bacterial contamination of health care workers' white coats. *Am J Infect Control* 2009. 37: 101-105.
10. Dixon M. Neck ties as vectors for nosocomial infection. *Intensive Care Med* 2000. 26: 250.
11. Bhusal Y, Laza S, Lane TW, Schultz K, Hansen C. Bacterial colonization of wristwatches worn by health care personnel. *Am J Infect Control* 2009. 37: 476-477.
12. Dancer SJ. Pants, policies and paranoia. *J Hosp Infect* 2010. 74: 10-15.
13. Farrington RM, Rabindran J, Crocker G, Ali R, Pollard N, Dalton HR. 'Bare below the elbows' and quality of hand washing: a randomised comparison study. *J Hosp Infect* 2010. 74: 86-88.
14. Jones A. Bare below the elbows: a brief history of surgeon attire and infection. *BJU Int* 2008. 102: 665-666.
15. Palazzo S, Hocken DB. Patients' perspectives on how doctors dress. *J Hosp Infect* 2010. 74: 30-34.
16. Monkhouse SJ, Collis SA, Dunn JJ, Bunni J. Patients' attitudes to surgical dress: a descriptive study in a district general hospital. *J Hosp Infect* 2008. 69: 408-409.
17. Ardolino A, Williams LA, Crook TB, Taylor HP. Bare below the elbows: what do patients think? *J Hosp Infect* 2009. 71: 291-293.
18. Shelton CL, Raistrick C, Warburton K, Siddiqui KH. Can changes in clinical attire reduce the likelihood of cross-infection without jeopardising the doctor-patient relationship? *J Hosp Infect* 2010. 74: 22-29.
19. Rehman SU NP, Cope DW, KilPatrick AO. What to wear today? Effect of doctor's attire on the trust and confidence of patients. *Am J Med* 2005. 118: 1279-1286.
20. Blumhagen DW. The doctor's white coat. The image of the physician in modern America. *Ann Intern Med* 1979. 91: 111-116.

21. Gherardi G, Cameron J, West A, Crossley M. Are we dressed to impress? A descriptive survey assessing patients' preference of doctors' attire in the hospital setting. Clin Med 2009. 9: 519-524.
22. Gooden BR, Smith MJ, Tattersall SJ, Stockler MR. Hospitalised patients' views on doctors and white coats. Med J Aust 2001. 175: 219-222

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No Author Comments

**Acknowledgement**

No Acknowledgement

**Other References**

No Other References