

## Knowledge and Experience of Medical Students with Male Urethral Catheterization

A.K. Eziyi<sup>1</sup>, S.O. Ademuyiwa<sup>1</sup>, J.A.E. Eziyi<sup>2</sup>, A.A. Salako<sup>2</sup>, A.O.A. Aderounmu<sup>2</sup>, A.S.A. Oyedeji<sup>2</sup>

Urology Unit, Department of Surgery Ladoke Akintola University of Technology Teaching Hospital (LTH), Osogbo, Nigeria,

<sup>1</sup>Department of Surgery Lagos University Teaching Hospitals, Lagos, Nigeria, <sup>2</sup>Department of Surgery Obafemi Awolowo University Teaching Hospitals Complex (OAUTHC), Ile-Ife, Nigeria,

*Correspondence to:* Dr A.K. Eziyi, E-mail: [eziyi1@yahoo.com](mailto:eziyi1@yahoo.com)

**Background:** Urethral catheterization is a commonly performed procedure. Therefore medical students should receive adequate training in this technique to avoid devastating consequences of performing it poorly. This study was aimed at finding out the knowledge and experience of final year medical students with the technique of male urethral catheterization. **Methods:** Well-structured questionnaire was administered to each of the final year medical students of Ladoke Akintola University of Technology (LAUTECH) one week to their final examinations.

**Results:** All the 215 students received the questionnaire one week before their final examinations with 128 (60%) completing it. The male to female ratio was 1:1 with a mean age of 28 years. One hundred and twenty-five (98.4%) of the students had been through male urethral catheterization. Thirty-five (27.6%) of the students have never performed male urethral catheterization. One hundred and fifteen students (90.6%) agreed that urethral catheterization is a sterile procedure. Sixty-nine (54.3%) students said xylocaine jelly should be used as lubricant. Ninety four (74%) students said that they will inflate the balloon of the catheter when the Y-junction gets to the tip of the penis. Forty-nine (38.6%) students said they are very confident about male urethral catheterization, 61 (48.0%) said reasonably confident while 5 (3.9%) are not confident at all.

**Conclusions:** Urethral catheterization is a common procedure. Students should receive adequate instruction in this technique to avoid devastating consequences of performing it poorly.

### Introduction

The use of urinary catheters should be avoided whenever possible. Urethral catheterization should only be done when absolutely indicated. A quarter of all patients admitted to hospital are catheterized and an estimated 4 million patients per year in the United States are subjected to urinary catheterization<sup>1</sup>. Urethral catheterization is a simple procedure that can have devastating consequences when performed incorrectly with associated significant morbidity and occasional mortality<sup>2</sup>. Too few students receive any instruction in this technique, despite attachment to urology firms<sup>3,4</sup>

Urethral catheterization is the most frequent retrograde manipulation performed on the urinary tract and it is a common procedure for both hospital and community patients<sup>5,6</sup>. It is estimated that 15% to 20% of patients have a Foley catheter at some point during their hospital stay.<sup>7</sup> Catheters are placed to drain the bladder during and after surgical procedures requiring anaesthetics, to assess urinary output in critically ill-patients, to collect reliable urine specimens, for urodynamics evaluation, for radiographic studies (e.g. cystograms), to assess residual urine, and for obtaining samples for urinalysis in infants<sup>6</sup>. Urethral catheterization is not without complications and many are unaware of contraindications or potential complications<sup>3,4,8,9,10,11</sup>. Catheter-associated urinary tract infection is the most common nosocomial infection, accounting for up to 40% of all nosocomial infection and more than 1 million infections in United State hospitals each year<sup>13-14</sup>. The prevention of these infections and other complications of urethral catheterization should begin with restricting catheterization to those patients for whom it is appropriate. Various forms of catheter are in use and have been used over the years but Foleys catheter introduced in 1930's by Frederick Foley is used in this study because it is the commonest form of catheter in use<sup>15,16,17</sup>. It is pertinent that medical students are taught the necessary skills for urethral catheterization before they become doctors. Although 98.4% of the students said they have been taught

male urethral catheterization only 38.6% said they are very confident about male urethral catheterization. We sought to assess the quality of teaching of this basic skill received by undergraduates at a state medical school in Nigeria. We also evaluated how much confidence these students have in this clinical skill. Medical students in our medical school spend four weeks in urology unit.

We have two consultant urologists, one senior registrar and two registrars in our urology unit. All these are involved in teaching essential urological skills to medical students.

### Subjects and Methods

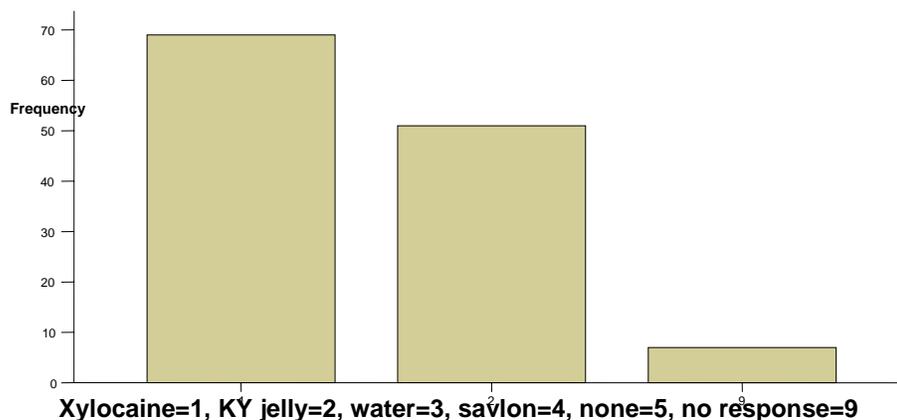
A well-structured questionnaire was administered to each of the 215 final year medical students of Ladoke Akintola University of Technology (LAUTECH) one week to their final examinations with 127 (60%) of them completing the questionnaire. Involvement in this study was voluntary and did not constitute part of the summative assessment. Information obtained included personal data, understanding about the technique of male urethral catheterization and level of confidence in the ability of the students to perform male urethral catheterization. The data obtained was analyzed using SPSS statistical software 13.0 to obtain percentages, means, median and standard deviation.

### Results

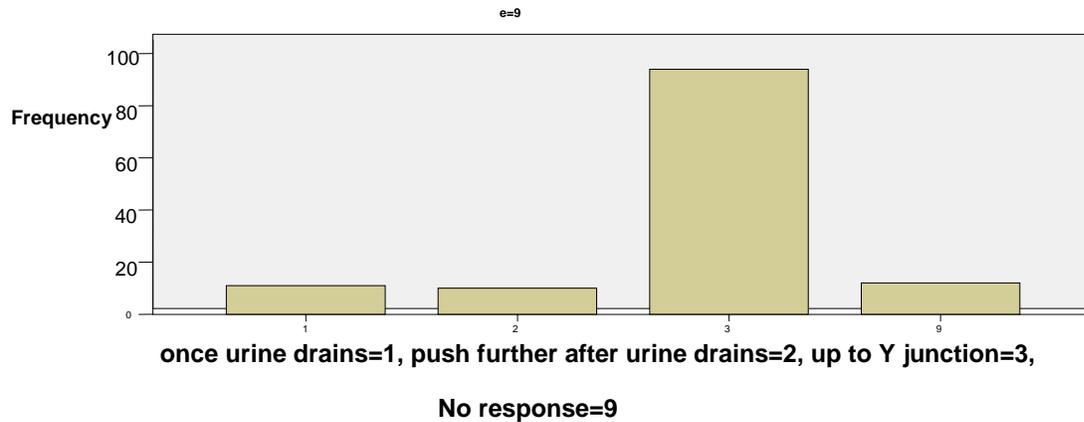
All the 215 final year medical students of Ladoke Akintola University of Technology (LAUTECH) received the questionnaire one week before their final MBBS examinations with 127 students (60%) completing it. The a male to female ratio of 1:1 with ages ranging from 21 to 35 years a mean age of 28 years. Sixty five (51.2%) students spent eight years, 40 (31.5%) students spent 9 years, 3 (2.4%) students spent 7 years, another set of 3 (2.4%) students spent 10 years in medical school while 16 (12.6%) students did not state the number of years they spent in medical school.

One hundred and twenty-five (98.4%) of the students said they have been taught male urethral catheterization, while 2 students (1.6%) had no response. Thirty-five (27.6%) of the students have never performed male urethral catheterization, 51 (40.2%) have performed one to two, and 32 (25.2%) have performed three to five, 5 (3.9%) six to nine, 2 (1.6%) students greater than 10 male urethral catheterization while 2 (1.6%) students had no response.

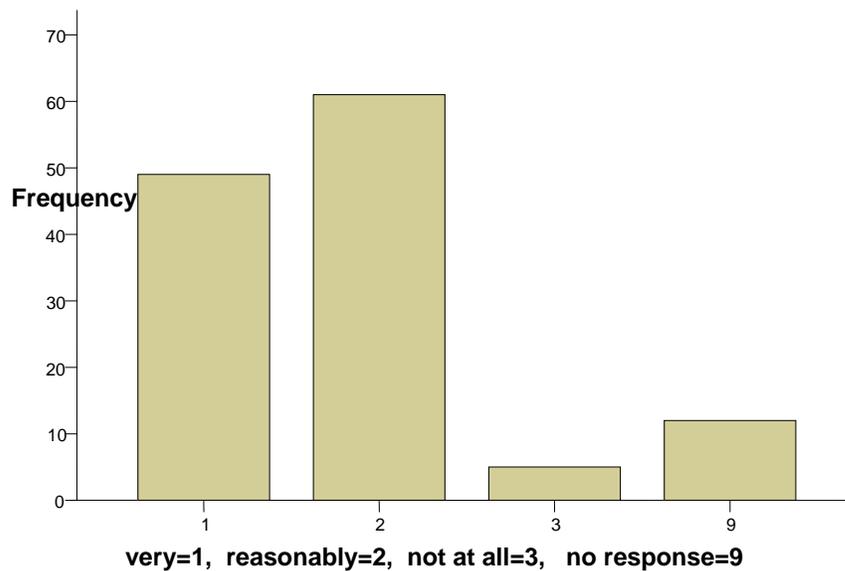
One hundred and fifteen students (90.6%) agreed that urethral catheterization is a sterile procedure, 7 (5.5%) said no it is not while 5 (3.9%) had no response. One hundred and six (83.5%) agreed that you have to don some gloves while performing urethral catheterization, 13 (10.2%) said no while in 8 (6.3%) students there was no response. One hundred and eleven (87.4%) said you have to do skin preparation while performing urethral catheterization, 10 (7.9%) said no while 6 (4.7%) students did not respond.



**Figure 1.** Type of lubricant used during urethral catheterization



**Figure 2.** The point balloon is inflated during urethral catheterization



**Figure 3.** Level of Confidence of the Students in Performing Male Urethral Catheterization

Sixty-three (49.6%) students said that savlon (centriomide and chlorhexidine) only is usually used for skin preparation, 32 (25.2%) said savlon and methylated spirit, 2 (1.6%) said methylated spirit only while 8 (6.3%) said savlon, iodine and methylated spirit combined is used, and 22 (17.3%) had no response. Sixty-nine (54.3%) students said xylocaine jelly should be used as lubricant, 51 (40.2%) said K-Y jelly while 7 (5.5%) had no response (Figure 1). Sixty-two (48.8%) said they prefer xylocaine jelly as a lubricant, 12 (9.4%) said K-Y jelly, while 53 (41.7%) students did not respond. Fifty (39.4%) students said they will use 0 to 5mls of the lubricant, 58 (45.7%) said 6 to 10mls, 6 (4.7%) said 11 to 15mls, 3 (2.4%) said 16 to 20mls while 10 (7.9%) had no response.

Eleven (8.7%) students said they will inflate the balloon of the catheter immediately urine start flowing out, 10 (7.9%) said you push even further even when urine start draining, 94 (74%) said up to the Y-junction, while 12 (9.4%) students had no response (Figure 2). Forty-three (33.9%) students said they will use 5 to 10mls of fluid to retain the catheter normally, 26 (20.5%) said 11 to 20mls, 12 (9.4%) said 21 to 30mls, 37 (29.1%) said specified capacity on the catheter while 9 (7.1%) had no response. Forty-

nine (38.6%) students said they are very confident about male urethral catheterization, 61 (48.0%) said reasonably confident, 5 (3.9%) are not confident at all while 12 (9.4%) had no response.

## Discussion

Although Watkin et al<sup>3</sup> found that too few students receive any instruction in this technique, despite attachment to urology firms, in this study 98.4% of the respondents had received formal patient-based teaching in catheterization either in the ward or clinic (fig. 1). This is not comparable to the findings of Carter R et al<sup>4</sup> where thirty junior house officers (graduate of five medical schools) were interviewed and they found that none of the interviewees had received any formal instruction regarding any aspect of urethral catheterization.<sup>4</sup> Despite the fact that most of the students have been taught urethral catheterization and that is the most frequent retrograde manipulation performed on the urinary tract<sup>5,6,7</sup> only, 40.2% have performed one to two, 3.9% greater than five, with only 1.6% greater than ten urethral catheterization (fig. 2). This is worse than the finding of Turner et al<sup>18</sup> among final-year medical students at Oxford Medical School just before their final examinations in 1999 where 19% of students had performed more than five catheterizations and 48% had performed two or less.<sup>17</sup> Out of the respondents 27.6% have never performed male urethral catheterization which although poor is relatively better than the finding in Sheffield university medical school where 38 of the 122 (31.1%) had never passed a urinary catheter<sup>19</sup>.

Urethral catheterization is poorly taught and most the students qualify with very little or no experience in performing catheterization<sup>4,18</sup>. A more practical approach to teaching of this procedure where each student is made to perform a minimum of ten urethral catheterizations under supervision is suggested. This will help reduce some of the complications of this procedure which include urethral injury, chronic renal inflammation, chronic pyelonephritis, nephrolithiasis, cystolithiasis, symptomatic urinary tract infection with pyelonephritis, bacteremia, sepsis, 'pain in the neck' and death.<sup>20-25</sup> Despite the fact that 98.4% of the students said they have been taught male urethral catheterization, 5.5% said it is not a sterile procedure while 3.9% had no response also (fig. 3) 10.2% said you do not have to don some gloves and 6.3% had no response. Further more 7.9% said you do not have to do skin preparation while performing urethral catheterization while in 4.7% did not respond. This trend should be watched since aseptic insertion of the catheter and careful maintenance of the drainage system are mandatory to prevent incidental bacterial contamination. Catheter-associated urinary tract infections are the most common nosocomial infection and a frequent cause of significant morbidity, sepsis, and death<sup>26,27</sup>

Although many authorities recommend that savlon (centriomide and chlorhexidine) should be used in skin preparation during urethral catheterization only 49.6% of the students in this study agreed that savlon only is usually used for skin preparation, 25.2% said savlon and methylated spirit, 1.6 said methylated spirit only while 6.3% said savlon, iodine and methylated spirit combined is used, 17.3% had no response<sup>28,29</sup>. Iodine and methylated spirit are not used in routine urethral catheterization because some patients develop hypersensitivity to iodine while methylated spirit is peppery and stinging on the Glans penis and inner prepuce. The students in this study appear better than some house officers in the work done by Carter et al<sup>4</sup> where none of them was aware of the nature of the antiseptic fluid used during urethral catheterization. Concerning urethral catheterization Neal<sup>29</sup> advised that this should be carried out using full aseptic technique, following a thorough wash of the hands and arms, sterile gloves should be donned and the external genitalia are gently cleaned using soapy antiseptic solution (Savlon). In the male, retrograde injection of five to fifteen milliliters of a water-soluble lubricant-anesthetic (e.g., 2% lidocaine hydrochloride jelly) and placement of a urethral clamp for 5 to 10 minutes to allow the anesthetic to contact the mucosal surfaces are recommended before any urethral instrumentation but we found 54.3% said xylocaine jelly should be used as lubricant, 40.2% said K-Y jelly while 5.5% had no response.<sup>30-32</sup> So almost all the students knew the quantity of lubricant that should be use in that only 2.4% said they will use 16 to 20mls while 7.9% had no response.

Although some urologist use water-soluble lubricant without anesthetic property like K-Y jelly, and this may explain why as much as 40.2% of the students said they will use it, it has been found that the use of topical lidocaine gel reduces the pain associated with male urethral catheterization in comparison with

topical lubricants only<sup>33-35</sup>. Most of these students are unlikely to rupture the urethra from catheterization since 7.9% said they will push the catheter even further even when urine start draining and 74.0% said up to the Y-junction. With self-retaining Foly catheters, complete advancement until the Y-shaped ports are at the meatus, the elbowed valve is at the meatus or once the urine returns it is wise to pass a few more centimeters of catheter into the bladder before the self-retaining balloon is inflated to avoid inflation of the balloon in the prostatic urethra which may result in severe pain and possible urethral rupture<sup>5,29,36</sup>. This point should be emphasized because rupture of the urethra constitute about 60% of cases of genitourinary trauma with iatrogenic injury from catheterization being the commonest cause in the West African region<sup>37</sup>. Forty-three (33.9%) students said they will use 5 to 10mls of fluid to retain the catheter normally, 26 (20.5%) said 11 to 20mls, 12 (9.4%) said 21 to 30mls, 37 (29.1%) said specified capacity on the catheter while 9 (7.1%) had no response.

Usually only 5mL to 10mL of fluid is used to inflate the balloon of the catheter but despite the fact that most of the students admits that they have been thought this procedure ( 98.4%), only 33.9% said they will use 5 to 10mls of fluid to retain the catheter normally.<sup>28,38,39</sup> The questionnaire did not assess the knowledge of the students on the appropriate size of catheter to be used in this procedure because this is variable and it is advised that one should choose the smallest urethral catheter that will accomplish the purpose of catheterization, because urethral secretions drain more easily around smaller catheters allowing egress of urethral secretions lessens the chance of a clinically significant urethral inflammatory response. In the adult, catheters of No. 16 to 18 Fr are most often chosen for routine bladder drainage; in the pediatric age group, it is often necessary to use feeding tubes of No. 3 to 5 Fr.<sup>28,29,31</sup> Furthermore despite adequate teaching of this procedure only 38.6% of the students said they are very confident about male urethral catheterization (Figure.3). Lack of adequate teaching, the teaching methods, the personnel teaching the procedure and the attitudes of the students may be some of the reasons why the students in this study seem not to understand the nitty-gritty of this procedure and also why they are not very confident in carrying it out.<sup>40-42</sup>

### Conclusions

Urethral catheterization is a common procedure. Students should receive adequate instruction in this technique to avoid devastating consequences of performing it poorly. We need to ensure that teaching is given to all our students and the use of male urethral catheterization mannequin is in use in some institutions to accomplish this<sup>18</sup>. Preparation of short teaching video to be shown to all medical students during their rotations may help them comprehend the nitty-gritty of this procedure<sup>4</sup>. A competency-based approach with assessment by trained supervisors will be of immense assistance as this has been shown to result in rapid acquisition of clinical skills<sup>43</sup>. A more practical approach to teaching of this procedure where each student is made to perform a minimum of ten urethral catheterizations is also suggested.

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