

Donning surgical gloves: A skill to be taught?

Gayatri L Patil¹, L S Patil², Shashikala P³

¹Professor of OBG & Member of Medical Education

²Professor & HOD Oncosurgery, ³Cordinator, Medical Education Unit,
S.S.Institute of Medical Sciences and Research Centre, Davangere,Karnataka.

[Received: 02/02/2014, Revised: 13/05/2014, Accepted: 15/06/2014]

ABSTRACT

Introduction: Teaching a clinical skill to medical students and later assessing them to know how best they have learnt it, will allow students to learn in a risk-free environment and to practice to mastery. This improves the competency and efficiency of our students in clinical skill learning. Learning to put on sterile surgical gloves is a simple and an important skill that has to be mastered by every medical student before they become interns.

Aim: To assess the skill of donning sterile surgical gloves among interns.

Methods: 101 interns willing to participate in this skill assessment were included for the study. Objective structured clinical examination was conducted to assess the skill. They were instructed to don a pair of surgical gloves in an open fashion-'open donning method' and skill was assessed using checklist. Relavent feedback was given to each intern at the end of the performance.

Results: It was noted that only 11% wanted to scrub hands before wearing gloves, 34.65% chose the appropriate pair of gloves but majority 63.36% put the wrong pair of left glove first, 53% could **adjust** the gloves by pulling the cuffs, 27% put two fingers into one finger space, 38% touched the bare skin with gloved hands. 4.95% tore the gloves. 69.30% removed the donned gloves properly and 73.26% discarded them in the dustbin.

Conclusion: This study indicates that medical students skill of donning gloves is not satisfactory. Donning surgical gloves is a basic and important skill, thathas to be taught to medical students in medical curriculum .

Key words: Clinical skill assessment of interns, donning surgical gloves psychomotor domain, skill learning.

Introduction :

The outcome of professional education should be appropriate development of skills and not mere acquisition of knowledge. As per the university curriculum, there is inadequate stress on what the students must be able to do. There is a definite need for clinical skill development.

A skill is defined as a refined pattern of movement or performance based upon and integrated with the perceived demands of the situation. In simple terms, skill is the ability to act appropriately in response to a situation.¹

Psychomotor skill comprises of perceptual and manual abilities towards patient care. The skill needs requisite knowledge and attitude.

Skill learning is an active process and needs repeated practice by the student. Teachers cannot transmit skills to students but they facilitate skill acquisition by allowing appropriate practice to students. Facilitation process for

skill learning includes the following fundamental steps:

*Explaining the skill and its theory, relevance, components and uses.

*Demonstration of the skill in a clear and effective manner and common mistakes which could happen

*Allowing students to practice using simulation labs or in reality.¹

According to Millar's pyramid a medical student learns skill in several steps. First he knows the subject (gains knowledge), then knows how to perform (competence) followed by performance (shows how) a lastly does the skill or applies it clinically. Wearing gloves or donning gloves involves psychomotor domain and is a basic skill which every medical student must learn. To achieve perfection of this skill proper knowledge and practice is needed². A four steps approach of teaching skills as suggested by Rodney peyton appears to be the best way to teach skill³.

Address correspondence to :

Dr Gayathri Patil, Professor of OBG
SS Institute of Medical Sciences and Research Centre.
Davangere-577005. Email:ptlgayatri@yahoo.co.in

Access this article online

Website : www.jermt.com

Quick Response Code :



This comprises demonstration deconstruction, comprehension & performance. Through wearing gloves properly is a skill, it is not taught in a medical college. Students learn by just observing their teachers wearing the same. Interns struggling to wear a pair of sterile gloves properly are a common observation.

Wearing gloves during medical examination, patient handling, surgery & laboratory is one of the important universal precautions, to prevent transmission of infection. Hence ability to wear sterile gloves is a must know clinical skill for interns, medical students, doctors & all paramedical personal involved in the care of patients.

There are two main types of gloves – examination and surgical. Surgical gloves have more precise sizing with a better precision and sensitivity and are made to a higher standard.⁴

Gloves for examination purpose are unpowered or powdered with cornstarch to lubricate the gloves, making them easier to put on the hands.

Surgical gloves are disposable and used during medical examination and procedures. They play a dual role in the health care environment, they act as a barrier to give personal protection and help and they also prevent the transmission of infection between the care givers and the patient. Ability to wear sterile surgical gloves is a must know clinical skill requiring psychomotor domain of learning.

Sterile glove usage is not a substitute for thorough hand hygiene. Hands should be washed thoroughly before donning gloves and after the gloves have been removed. It is important to choose a glove of well fitting size.

Surgical gloves are commercially available as ready to wear sterile pairs in sealed paper packages. They should be used once and then disposed off properly.

Gloves may be put on in either an open or closed fashion, otherwise called as “Closed Donning” or “Open Donning”. Closed gloving is used where the surgeon will be wearing a sterile gown. Open gloving is used when the doctor will be performing a minor procedure or handling tissues, without wearing a sterile gown.⁵

Donning open gloves :

Gloves are cuffed to make it easier to put them on without

contaminating them. When putting on sterile gloves, first glove should be picked up by the cuff only. The second glove should be touched only by the other sterile glove.⁶ there are some steps to be followed before wearing a pair of glove.^{7,8}After the procedure, gloves have to be removed and discarded in a proper way. The present study was undertaken to assess this basic clinical skill of donning surgical gloves among interns and to know whether this skill needs to be taught to them.

Methodology

101 interns who were willing to participate in the study were included after taking consent. Ethical clearance was obtained from Institutional Ethical Committee. The method of assessment used was OSCE (objective structured clinical Examination). Participants were divided into 10 batches. Nine batches consisting of 10 interns each and the last batch had 11 interns. Two OSCE Stations were set up. Each station was equipped with adequate number of gloves of different sizes to suit the needs of the participants. A stock of gloves was also kept ready to replenish the source as and when required .Written instruction was provided to the participants. A color coded dustbin for discarding removed gloves was kept near each station. The participants were instructed to don one pair of sterile surgical gloves in an open fashion. Time allotted was 2 minutes. The skill was assessed using a checklist by a faculty at each station. Appropriate feedback was given to each intern, after performing the skill to correct or rectify the mistakes and to reinforce skill learning. At the end of the session after assessment of each batch the correct method of donning of surgical gloves was taught using four step approaches to skill learning. The study was conducted over a period of four weeks with two to three batches per week. Time of conducting each session varied depending on the convenience of interns. There was no apprehension and interns participated with enthusiasm as this was not a part of their academic assessment.

The checklist used included observation of various steps in donning of gloves (Table 1). In addition to donning of gloves, interns were observed for the glove removing technique and the practice of proper discarding of the used glove.

Observation	Performance	Number and % of students Yes	Number and % of students No
Mentions about scrubbing hands before wearing gloves.	Yes / No	11(10.89)	90(89.10)
Chooses appropriate gloves.	Yes / No	35(34.65)	66(65.34)

Uses the left hand to pick the right glove by the cuff.	Yes / No	37(36.63%)	64(63,36)
Puts on the right hand first.	Yes / No	37(36.63%)	64(63,36)
Uses the right gloved hand to pick the left glove by the cuff.	Yes / No	Nil	Nil
Pulls the cuffs of both the gloves upwards.	Yes / No	53(52.47)	48(47.52)
Then adjusts the gloved fingers of both hands.	Yes / No	46(45.54)	55(54.45)
Puts 2 fingers together in one finger space.	Yes / o	27(26.73)	74(73.26)
Touches the bare skin with gloved hands.	Yes / No	39(38.61)	62(61.38)
Tears the gloves.	Yes / No	5(4.95)	96(95.04)
Right choice of size	Yes / No	25(24.75)	76(75.24)
Time taken	1-2 minutes		
	>2minutes	38(37.62)	63(62.37)
Method of removing gloves	a) One at each time	70(69.30)	31(30.69)
	b) Rolling back		
	c) Tears while removing	70(69.30)	31(30.69)
Puts back the used gloves	a) Into the bin	74(73.26)	27(26.63)
	b) Leaves it on the table	(a)	(b)

Results

Of the 101 interns who participated in the study, only 11(10.89%) had an intention to scrub hands before putting on sterile gloves, .35(34.65%) did keep the options of choosing an appropriate pair of gloves, 37(36.63%) used the left hand to pick up the right glove first, while 64(63.36%) chose the left glove to be worn first, which is ideally worn later.

After wearing the gloves, 53(52.47%) rightly adjusted the gloves by pulling the cuffs upwards and 46(45.54%) neatly adjusted the gloved fingers.

27(26.73%) of them put two fingers into one finger space 39(38.61%) of them could not maintain the strict aseptic technique as they touched the bare skin with gloved hands.

Just 25(24.75%) could choose the right size and 5(4.95%) tore the gloves during use, probably due to inappropriate size.

38(37.62%) took one to two minutes to perform the skill and 70(69.30%) of them used the right technique to pull out the gloves one by one, rolling outwards. Almost 74(73.26%) of them put the used gloves in the waste bin after usage, while 27(26.63%) just left the used gloves on the table and walked off.

Discussion :

We all agree that donning of Gloves is a must know skill as doctors in daily practice have to wear gloves. How skilled are our interns in donning gloves was a curiosity as we kept observing interns struggle to wear the gloves in operation theatres. Literature search did not reveal studies regarding the same and hence this study was undertaken. The results of this study make us realize the need for this skill to be taught. Unless interns are taught to put on sterile gloves in the right manner, maintaining asepsis can not be assured during procedures.

The current 'gold standard' for glove donning is thought to be the closed glove technique. Newman teal aimed to determine whether there is a difference between 3 different glove donning techniques, open ,closed and scrub staff assisted in terms of accidental glove contamination and concluded that best practice of glove and gown donning is scrub staff assisted method.⁹

Dumber teal compared open versus closed glove donning technique during intraoperative glove changes and found that open technique produced less contamination than closed technique.¹⁰

In spite of becoming medical graduates, the performance of interns in this study makes them understand the importance of learning this simple skill. We strongly

recommend the need for this skill to be taught as soon as the students join MBBS and start handling the cadavers and working in the laboratory. It is important to implement simulation teaching at all medical institutions by setting up skill lab.

Conclusion :

Glove donning is a basic and important skill to be taught to medical students. We recommend that this skill has to be taught as soon as the students join medical school and reinforced and rethought at regular intervals at the beginning of clinical postings using four steps approach to skill learning to make sure that students achieve perfection of this by the time they start their internship. This avoids the chances of infection in operating theatre which could occur because of contamination due to faulty technique of glove donning.

It is important to make an extensive use of simulated learning methods at the surgery skill lab for all final year medical students. This will teach the undergraduate students the basic surgical skills like donning sterile surgical gloves which can provide them a strong foundation in clinical skills prior to their compulsory internship or postgraduate courses. This education experience makes the students prepared and confident to meet the challenges of performing and practicing skills as junior doctors during their clinical postings.

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How to Cite this article :

Gayatri L P, L S Patil, Shashikala P. Donning surgical gloves : A skill to be taught? *J Educational Res & Med Teach* 2014; 2(1):43-7.

Funding: Declared none Conflict of interest: Declared none