

# Assessment of Suturing Skill among Interns using an Innovative Simulation

L S Patil,<sup>1</sup> Gayatri L Patil,<sup>2</sup> Shashikala P<sup>3</sup>

<sup>1</sup> Asso Prof, Gen Surg, <sup>2</sup> Prof, OBG & member of medical education

<sup>3</sup> Prof & HOD, Pathology and Co-ordinator, Med Education

S.S.Institute of Medical Sciences and Research Centre, Davangere, Karnataka.

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## Abstract

**Background:** Junior doctors need to have the skills to competently perform a wide range of procedures and inability to do so is an important stressor for a new doctor. Internship is critical period for learning many of these skills.

**Aim:** To assess the basic surgical skill of putting a simple vertical mattress stitch by Interns through Simulation.

**Methodology:** 101 interns, working at various departments consented to participate in the study for a period of four weeks. They were asked to put a mattress suture on a simulated dummy.

**Result :** It was noted that 10% had awareness about aseptic precautions. Though 33% of them completed their surgical postings, only 38% of the interns could put the mattress stitch in the right way. Choosing the right instruments was not so difficult, but holding the instrument in the right way (28%) and tying the knot appropriately (21%) was like a marathon to many of them.

**Conclusion:** Suturing skill is a form of psychomotor domain which needs practice to perfection. Adopting a four step approach to teaching skills like suturing will enable junior doctors to perform skills with confidence.

**Key Words:** Interns, Suturing skill, Simulation.

## Introduction :

In Educational spiral each learning objective belongs to a specific domain of learning and needs to be measured and assessed to determine if they have been successfully learnt.<sup>1</sup> Teaching psychomotor skills to medical interns is one of the most crucial tasks of medical teachers and assessment of technical skills in operation theatres is difficult due to time, ethical issues and medico legal concerns. Some of these tasks are complex and difficult to be taught in real life situations.<sup>2</sup>

Psychomotor skill comprises perceptual and manual abilities towards patient care. The skill needs requisite knowledge and attitudes. Skill learning is an active process and it 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, demonstration of the skill in a clear and effective manner and then

allowing students to practice using simulation labs or in reality.<sup>3</sup>

Suturing skill is a form of psychomotor domain which needs practice to perfection. Four step approach suggested by Rodney Peyton of the Royal College of Surgeons: Demonstration, Deconstruction, Comprehension and Performance ensures that the teacher breaks process into manageable steps, asks the learner to vocalize the steps and provides repetition to reinforce the learning and correct mistakes.<sup>4</sup>

Internship serves as a bridge between the theoretical learning of a medical student and the practical skills of a trained physician. Suturing and knot tying skills are two essential skills needed for a successful medical practice, regardless of the field of specialization. Traditionally however, it is taken for granted that students somehow pick these skills up along the way, only those who opt for surgery are taught to them formally.

Every doctor could encounter wounds in need of suturing and it is important to become proficient.

## Correspondence:

Dr Gayatri L Patil  
Email : ptlgayatri@yahoo.co.in  
Mob. : +91 9886733535.

Access this article online

Website : [www.jermt.org](http://www.jermt.org)

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Mattress suture are good choice when the skin edges are difficult to evert. It is technically challenging to place mattress sutures as good dermis to dermis contact is achieved. Vertical mattress suture is superior to all other stitches due to its quadruple ability to achieve deep and superficial wound closure.

So we chose this particular must and should know skill as an assessment tool for the interns to perform within the allotted time on a simulated module.

### Aim

To assess the basic surgical skill of putting a simple vertical mattress stitch by the interns on a simulated module.

### Methodology

Study was undertaken following Institutional ethical clearance and expressed consent from 101 interns working at various departments in the tertiary care hospital over a period of four weeks from 1<sup>st</sup> to 31<sup>st</sup> May 2013.

Each intern was asked to put one vertical mattress stitch using a non absorbable suture material (cotton thread) on a simulated dummy, for which a small cotton stuffed pillow with a thick cover was used and it was cut vertically to simulate a long lacerated wound.

The steps of the procedure were assessed by the demonstrator using marker checklists, as a part of formative evaluation. The total time allotted was 3 minutes. Appropriate feedback was given to junior doctors for reinforcing skill learning and also for correcting mistakes. Later the correct method of putting vertical mattress sutures was taught to them at the end of the session.

### Check-list For Suturing

- Has undergone Surgery posting Yes/No
- Wishes to scrub hands before putting gloves Yes /NO
- Wears sterile gloves Yes/No
- Skin preparation, xylocaine choice, drapes
- Chooses the instruments from the tray Yes/No
- Right choice of instruments a) Needle holder, b) Toothed forceps, c) Suture cutting scissors.
- Holding needle holder : Right way/Wrong way
- Holds the needle with the needle holder: Right way/Wrong way.
- Puts a vertical mattress stitch Right way/Wrong way.
- For knot tying a) Uses the instruments, b) Uses hands
- Tightening the knot a) Parallel to the suture line b) Perpendicular to the suture line.

- Tied knot is too tight /too loose /just right.
- Cuts the suture ends Right way(tip) / Wrong way (centre)
- Length of the suture threads left a) < 1cm, b) 1cm(adequate), C)>1cm
- Total time taken for the stitch to be put a) < 2 mins, b) 2- 2.5 mins
- Puts the instruments back into the tray Yes/No
- Leaves the instruments & walks off Yes/No
- Could not put the mattress stitch at all Yes/No

### Results

Of the 101 interns who consented for the study, about 33(32.67%) of them had completed their surgical postings as part of their compulsory rotatory internship programme.

As a prior necessity, only about 11(10.89%) interns wished to scrub their hands before wearing sterile gloves. The next step being choosing the appropriate instruments, 75(74.25%) interns were able to pick the required instruments from the tray. Then they were observed on how they handled these instruments. 29(28.71%) interns held the needle holder in the wrong way and 55(54.45%) could not even place the needle properly in the needle holder.

Putting this vertical mattress stitch using the standard technique, was possible only with 35(38.46%) interns. 56 (61.53%) interns somehow managed to put the stitch using various methods, not acceptable otherwise. 10(9.90%) of them could not put the mattress stitch at all, in the allotted time limit.

Ideally the knot has to be secured or tightened by pulling it parallel to the suture line which was well demonstrated by 20 (21.99%) interns. 54 (59.35%) of them used their hands to tie the knot like a shoe lace knot, which is poor skill performance.

The final step was to use the scissors to cut the suture ends. 25(27.49%) interns did it right while 74(81.37%) of them did not know the right technique of using the scissors and keeping about 1 cm adequate suture length.

After the task, only 61(67.03%) interns neatly put back the used instruments into the tray, degloved themselves and left the venue.

### Discussion

Skill is a refined pattern of movement or performance based upon and integrated with the perceived demands of the situation. As per the Miller's pyramid, a medical student initially gains knowledge or knows the subject, then knows how to perform (Competence), then shows how (performance) and then lastly does the procedure or applies it clinically<sup>1</sup>.

In the present study 32 % of interns had completed their surgical postings and they performed better than the remaining group of interns as compared to other study where authors conclude that simulated surgical skills station can be used to evaluate procedure performance objectively and to test for interval improvement.<sup>5</sup>

Van Empel conducted a study to compare objective assessment of open knot tying skills by 99 residents before and after a knot tying course, which showed improvement after one training day. This study shows that we need to implement training sessions using simulators to improve performance scores.<sup>6</sup>

Shabbir in their study conducted a one-day suturing and knot-tying workshop. The suturing skills of the trainees were assessed before and after the training by Objective Structured Assessment of Technical Skills (OSATS), using a checklist. In the first workshop, a pre-training questionnaire was used to assess their knowledge about sutures and their perceptions about the workshop. This study also shows that performance scores were better after training sessions and OSCE pattern of assessment can assess each step of the suturing technique in detail as observed in the present study.<sup>7</sup>

Educational programs should be designed to meet the training needs of junior doctors performing minor procedures. All the interns need to be trained in the basic suturing principles, which include handling instruments correctly, choice of appropriate suture material, know the types of sutures and the right way to put simple sutures. These sessions should be conducted by the teaching faculty on a regular basis for all the junior doctors.

## Conclusion

Medical education is rapidly evolving. We need to teach our interns the basics of suturing as it is not ethical to let them to conduct procedures without optimum supervision, as an unsupervised intern makes an error, it can have serious repercussions. Teaching of basic surgical skills is both feasible and advantageous using simulation. Basic surgical skills should be taught to all medical students regardless of their career aims, at all medical colleges.

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