



# Preoperative Preparatory Talk (PPT): Developing Operative Expertise of Plastic Surgery Trainees by Three Rounds of Preceptor-Trainee Discussions

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## Abstract

**Background** Plastic surgery training requires the trainee to assist in surgeries to improve their on-table decision making and hone their surgical skills, but this results in an increased risk of intraoperative complications and increased operative time. It is important to have a training method that orients the trainee toward the surgery to ensure patient safety.

**Materials and Methods** A training method called preoperative preparatory talk (PPT) was devised in which the preceptor orients the trainee toward the planned surgery in three phases. Comparison and statistical analysis of mean operative times of four stages of free flap surgeries after PPT and without PPT were done. Objective Structured Assessment of Technical Skill (OSATS) scores of surgical trainees were also documented for surgeries done with and without PPT and statistical analysis was done for comparing these scores.

**Results** Statistical analysis via unpaired *t*-test confirmed that after applying PPT, there was a significant decrease in time taken in three out of four stages of free flap surgeries: flap planning and harvesting, recipient site preparation and vessel dissection, and flap division and partial inset. Trainees were found to be better oriented toward the surgery which resulted in a better performance on table that was confirmed by statistical analysis of OSATS score via unpaired *t*-test.

**Conclusion** PPT ensures better learning for the resident and improves patient safety because of better orientation of the operating team toward the procedure and operating steps. This reduces the operative time of free flap surgeries. We recommend this training method to be incorporated in plastic surgery training programs.

## Keywords

- plastic surgery
- training
- patient safety
- free flap

## Introduction

Plastic surgery is an ever-evolving branch and so is surgical training. With the day-to-day advancement in surgical nuances, more emphasis is being given to patient safety. There are various avenues for surgical training namely training on animals, cadavers, ex vivo tissues, mannequins, computer simulators, and virtual simulators,<sup>1</sup> but none of these can measure up to real-time clinical training. Studies have shown that a successful outcome depends 75% on decision making and 25% on surgical skills.<sup>2</sup> Only bedside clinics and real-time learning in operation suites can train a surgeon in decision making. However, in most plastic surgical training systems, where trainees learn skills in the operating theaters, training is provided at the expense of longer operating times and greater potential for misadventure because of the relative inexperience of the trainee.<sup>3</sup> We devised a three-phase approach of preoperative preparatory talk (PPT) to prevent these mishaps (►Table 1). The PPT is two-way communication between the senior surgeon and the surgical trainee.

## Methodology

Between July 1, 2019 to December 31, 2021, the free flap surgeries performed in our tertiary care center were divided into study group and control group depending upon whether our teaching model was followed or not. Mean operative time of surgeries in the two groups was calculated and compared. We also analyzed the time taken in various steps of the free flap surgery and compared these times between the two groups of surgeries. These steps included planning and harvesting of the flap, preparation of recipient site including vessel dissection, division of partial inset of flap before anastomosis, and anastomosis and flap inset completion. The performance of residents in each surgery was marked on Objective Structured Assessment of Technical Skill (OSATS) global rating scale and their mean OSATS score for the two sets of surgeries was compared and statistically analyzed using unpaired *t*-test. OSATS score involves scoring the resident's performance on seven parameters on a scale ranging from 1 to 5.<sup>4</sup>

Our teaching method PPT involves three phases of discussions between surgical preceptor and resident surgeon. PPT phase 1 takes place when the patient presents to the OPD. Here, the senior surgeon instructs the resident surgeon to get the required investigations done, to arrange the reports of previously done radiological investigations, and, if required, to take opinions from other specialties.

Phase 2 of the PPT takes place the next day during ward rounds where the senior surgeon informs the trainee on various aspects of surgical planning. The trainee is informed about the part preparation of the patient, arrangement of sutures, instruments and implants required for the surgery, and salient points to be communicated to the patient as part of the operative consent. After discussing the operative steps in detail, the resident is encouraged to discuss the radiological films with colleagues from radiology to develop an understanding of the radiological anatomy and to relay it to the senior surgeon. The senior surgeon also suggests important resources to be read by the resident before coming to the surgery.

Phase 3 of PPT takes place on the day of surgery inside the operative suite. Here, the resident has to show his preparation for the surgery by presenting the plan in the form of Microsoft Powerpoint slide (►Fig. 1) or a whiteboard/flipchart diagram similar to the whiteboard talks mentioned by Demirseren et al.<sup>5</sup> Senior surgeon assesses the preparation of the resident when the resident is presenting his plan (►Fig. 2).

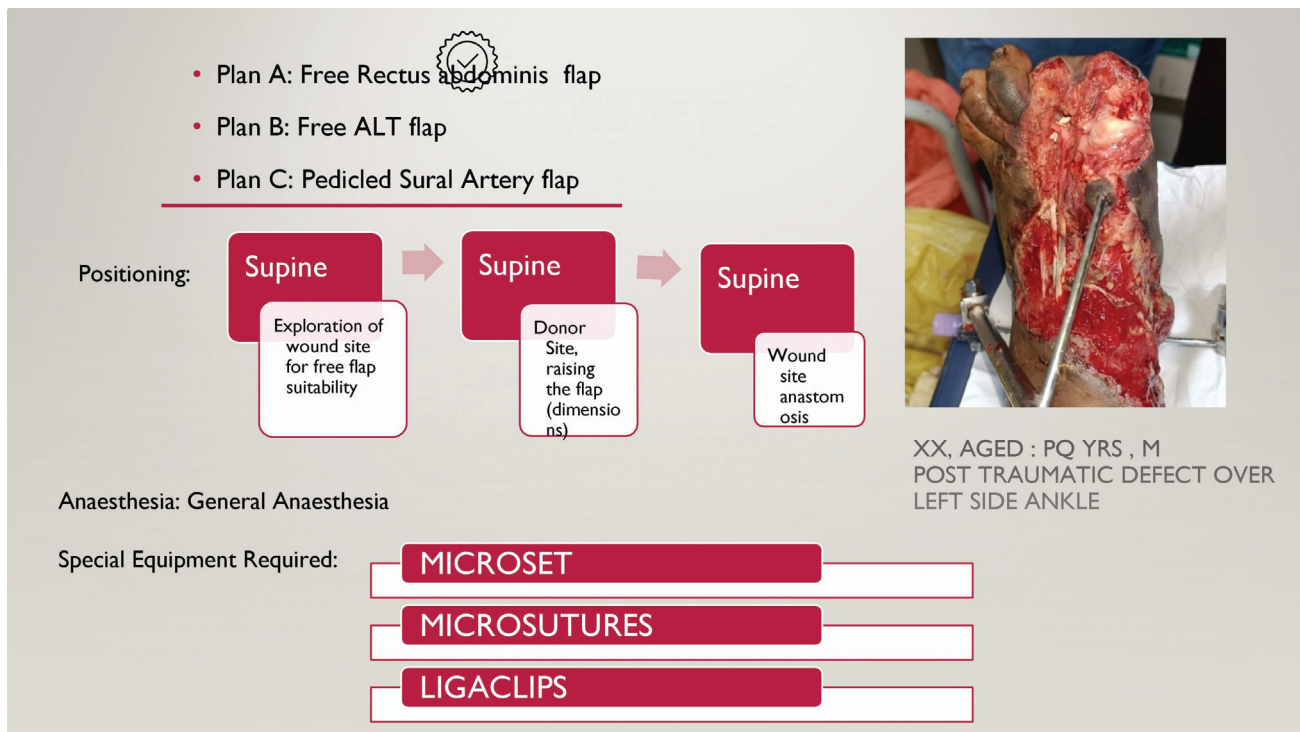
Patients were allotted into two groups depending upon the availability of senior surgeon and resident surgeon for the three phases of PPT and whether the resident surgeon has prepared the presentation properly. For the study group, the senior surgeon was available for both the days prior to the surgery and all three phases of PPT took place. Cases for which any phase of PPT could not be done due to unavailability of the senior surgeon or trainee surgeon were placed in control group. It is to be noted that the resident prepared for the surgeries in the control group on their own without involvement of the surgical preceptor.

## Results

Out of the 63 free flap surgeries that we performed during the course of our study, 37 cases were put in the control group and 26 cases were put in study group. Mean operative time of entire surgery and for various stages of free flap surgeries in two groups was compared and statistically analyzed using unpaired *t*-test. In study group, mean operative time for entire surgery was 376 minutes, while it was 443 minutes in control group (*p*-value < 0.05). Effect size for the unpaired *t*-test is -2.05. Mean time taken for flap planning and harvest was 149 minutes in study group and 193 minutes in control group (*p*-value < 0.05). Mean time taken for recipient vessel dissection and recipient site preparation was 77 minutes in study group and 93 minutes in control group (*p*-value < 0.05). Mean time taken for division and partial inset of flap was 49 minutes

**Table 1** Phases of preoperative preparatory talk

		Learning domains addressed
Phase 1	In outpatient at the time of admission	Cognitive and affective
Phase 2	On preoperative day	cognitive
Phase 3	On the day of surgery	Cognitive and psychomotor



**Fig. 1** Digital preoperative preparatory talk slide.



**Fig. 2** Trainee presenting the slide to the senior surgeon in the operation suite.

in study group and 53 minutes in control group ( $p$ -value  $< 0.05$ ). Mean time taken in anastomosis and flap inset completion was 101 minutes in study group and 104 minutes in control group ( $p$ -value = 0.53).

Mean OSATS scores of residents were 33.08/35 for study group and 28.08/35 for control group, and statistically analyzed using unpaired  $t$ -test and the difference was found to be significant ( $p$ -value  $< 0.05$ ) (→ **Table 2**).

## Discussion

A proper surgical training requires improvement in all three domains of learning, namely cognitive, psychomotor, and affective.<sup>6</sup> While most residents join the residency program with a focus on psychomotor domain of training, it is necessary for the training director to ensure that residents are finally equipped in all three domains before passing out from the program. Multiple studies have focused on improving outcomes in each of the domains separately. However, an ideal surgical teaching and training program should consider a global improvement in all the domains for the trainee. In addition, consideration is to be placed toward the comfort, ethicality, and outcomes for the patient. Permitting a surgical trainee to assist a senior surgeon without acquiring adequate surgical competency of the procedure is a drain on resources as it can increase the operation theater time by as much as 40%.<sup>7</sup> Studies have shown that each minute of operative theater time costs US\$ 9.57, and that is excluding the cost of increased anesthesia.<sup>8</sup> Also, it fails to inculcate the habit of discipline that is an important trait of a surgeon. Studies have shown that surgical knowledge can be best acquired by dealing with an actual patient, and surgical skill by operating on a patient and affective skills are best developed by communicating with the patient. Data are scarce on the best way to improve efficiency of a surgical trainee in a real environment. By introducing this stepwise training

**Table 2** Comparison of durations of steps of free flap surgery and performance of residents with and without following PPT

Parameter	Time taken (in minutes)/ OSATS score (out of 35) in study group	Time taken (in minutes)/ OSATS score (out of 35) in control group	p-Value in unpaired t-test
Flap planning and harvest	149	193	<0.05
Recipient vessel dissection and recipient site preparation	77	93	<0.05
Division and partial flap inset	49	53	<0.05
Microvascular anastomosis and inset completion	101	104	0.53
Total operative time	376	443	<0.05
OSATS score (out of 35)	33.08	28.08	<0.05

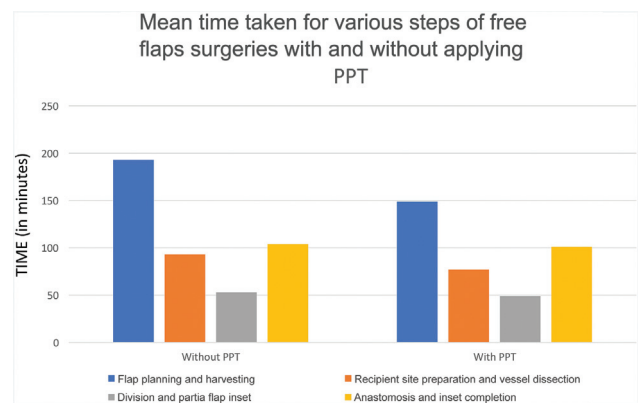
Abbreviations: OSATS, Objective Structured Assessment of Technical Skill; PPT, preoperative preparatory talk.

system of PPT, we hope to help the residents approach surgical patient care in a focused manner. The first phase helps to orient the resident toward preoperative workup of a surgical patient. This phase can start on the day of admission or even when the patient first comes for an OPD consultation. Here, the resident develops the affective skills of communicating with the patient counselling about the treatment options and outcomes of surgery. The resident also builds up on the knowledge of the disease condition itself, investigations relevant to reach a diagnosis, and the pathology itself. The second phase of PPT happens post-admission and prior to the actual day of operation. Here, the resident is instructed to examine the patient, plan treatment, and present in form of a case presentation. The senior surgeon then assesses the understanding of the resident, discusses the relevant investigation findings and operative plan, thereby building up the cognitive domain of the resident. Phase 3 of the PPT starts on the day of surgery when the resident is advised to come prepared with the information of the patient, surgery to be done, and steps of surgery to be performed. The resident presents his plan to the senior surgeon and additional inputs may be given by the latter. This phase aims to evaluate the psychomotor domain of surgical learning. It becomes easier for the resident to follow the chief surgeon when they come prepared with the steps of surgery and relevant anatomy beforehand thus facilitating the conduct of actual procedure when needed.

After following PPT, all the stages of a free flap surgery took significantly shorter time to finish except microvascular anastomosis (► Fig. 3).

This can be attributed to the fact that a surgeon's comfort and coordination with their first assistance determines the ease and pace at which a microvascular anastomosis is performed. This step was not influenced by the PPT training method as much as the other steps of the surgery.

We found that all the senior residents showed a significant improvement in their knowledge of instruments, use of assistants, flow of operation and forward planning, and knowledge of specific procedure after following PPT. There was no significant improvement with respect to instrument handling, time and motion, and respect for tissue. This



**Fig. 3** Chart comparing mean operative times between various stages of free flaps with and without applying preoperative preparatory talk (PPT).

shows that three rounds of PPT will improve the resident's knowledge of the steps of the specific procedure and the instruments involved in that surgery that will in turn improve the flow of operation and use of assistants, while the other parameters pertaining to basic surgical skill like respect for tissue, time, and motion and instrument handling will only improve with time and increased hands-on experience.

The three phase PPT is an elegant method to improve surgical training irrespective of the subspeciality as it decreases operative time by better orientation of the assisting trainee surgeon toward various nuances of the particular surgery.

## Conclusion

The authors have tried to devise a training method that stimulates all three domains of learning as proposed in Blooms's taxonomy. We found that diligent following of this method leads to better orientation of the resident toward the operative procedure and thereby results in better time management. It also ensures better patient safety as the resident is well-versed with preoperative workup required for the patients. The presence of these three checkpoints

before the trainee scrubs ensures that all the safety parameters are ensured. We recommend the three rounds of PPT to be incorporated in all plastic surgery training programs and may be adopted in other surgical branches as well.

#### Conflict of Interest

None declared.

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