# Discharge Criteria and Complications After Day Care Surgery.

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## ABSTRACT

**Aim of study:** Determining essential components of an effective discharge scoring system, discussing potential complication and its prevention and treatment during day care anaesthesia and comparing relative importance of propofol and thiopentone sodium in day care anaesthesia as their role in early discharge and better recovery. **Material and method:** 100 patients of ASA grade I and II to be divided into two groups of 50 each. Group I received Inj. Propofol 1.5mg/kg and group II received Inj thiopentone sodium 5mg/kg intravenously as induction agent. Short diagnostic surgical procedures less than 20 minutes were included. After completion of surgery patients were assessed for the recovery phase. Phase 1 recovery time: Discontinuation of anaesthesia to recovery of protective reflexes. Phase 2 recovery time: Patients assessed in recovery room with the help of the modified aldrete scoring system at 0, 5, 10, 15 and 20 minutes. We observed various complications like nausea, vomiting, pain, headache, difficulty in voiding urine, drowsiness and hangover. Patients were discharged after they have no complains. **Results:** Phase1 mean recovery time in group I was 8.77±1.66 minutes as compared to group II it was 11.18±2.61 minutes. Modified aldrete score for phase II recovery in group I was 6.39±0.97,8.17±0.69,9.71±0.25,10±0,10±0 at 0,5,10,15,20 minute respectively while in group II score was 4.77±0.97,5.88±0.96,6.88±0.87,8.52±0.65,9.87±0.33 at 0,5,10,15,20 minutes respectively (P value <0.0001). Discharge time for group I varies from 110 to 160 minutes with mean time of 136.98±11.46 minutes as compared to group II it was 135 to 195 minutes with mean time of 164.5±12.22 minutes (P value <0.0001). In group I complain of pain, nausea and vomiting, headache found in 23,6,2 patients respectively while in group II pain, nausea and vomiting, headache, dizziness and hangover was higher as 28,11,3,2,1 respectively. **Conclusion:** Propofol is safe anaesthetic drug for early patient discharge in day care unit compare to thiopentone sodium. Proper preoperative preparation, intra operative anesthetic management and proper monitoring enhance the recovery. Each anesthetist should develop the technique that permits the patients to undergo the surgical procedure with minimal stress and maximum comfort and optimize his/her chance of early discharge.

**Key words:** Day care surgery, Modified Aldrete Scoring System, Propofol, Thiopentone sodium, Complications

## Introduction

Day care surgery is known by several names as outpatients surgery/ambulatory surgery /fast track surgery/same day surgery. Ambulatory surgery is a specialized area of care that allows patients to have surgery and then return home the same day. Post anesthesia care unit bypass, called fast tracking is another recent innovation in outpatient anesthesia. The growth in ambulatory surgery would have not been possible without development of improved anesthetic and surgical techniques. Success of day care surgery can be attributed to advance in surgical technologies as

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well as in the field of anesthesiology [1].The availability of rapid, short acting anesthetic, analgesic, sympatholytic and muscle relaxant drugs as well as improved monitoring devices, it has been possible to minimize the adverse effects of anesthesia on the recovery process. It is important for anesthetist to provide the best anesthetic care and to facilitate their return to daily work. With careful monitoring either general, local or regional anesthesia can be proper techniques to the need for day care surgery. Recovery is a term used in anesthesia and surgical practice. This term may be perceived very differently among patients, surgeons and anesthetist. Anesthetist thinks that their patients have recovered when they regain their consciousness and preoperative physiological state [2].It is important to understand the process of recovery and to identify criteria that can be used to determine when patients have recovered enough to go home safely under the care of an escort. Recovery is a continuous process and can be divided into three phases:

Phase 1 Early recovery: Awakening and recovery of vital reflexes.

Phase 2 Intermediate recovery: Immediate clinical recovery as coordination and allowing ambulation/home readiness.

Phase 3 Late recovery: Full recovery including its psychological recovery.

Recovery is a continual process that early stage of which overlaps the end of intra-operative cares [3]. Recovery is usually achieved by using different scoring system. The Aldrete and Keoulik scoring system was first described in 1970. With the advert of pulse oximetry as a more reliable indicator of oxygenation; the Modified Aldrete Scoring System has been designed. With the use of newer drug and techniques more rapid awakening and phase 1 recovery may be completed in operation room and bypassing the PACU, known as "fast tracking" [1].The fast tracking scoring system include pain and emesis along with modified Alderet score. There are also Wetchler's guidelines and Kortilla's guidelines for safe discharge after ambulatory surgery [2]. Apart from clinical guidelines psychomotor tests like hand coordination and memory test are also used. But many psychomotor tests are complex and time consuming and require special equipment that is not readily available. They assess recovery of brain functions only, rather than complete recovery of patients; so not routinely used in clinical practice [3].

Appropriate selection and patients preparation is crucial for day surgery. Anesthetic techniques should ensure minimum stress and maximum comfort for the patients and should consider the risk and benefits of the individual techniques. Analgesia is paramount and must be long acting, nausea and vomiting must be minimized [4].So we decided to understand the process of patient recovery and to identify criteria that can be used to determine when patients have recovered enough to go home safely under the care of an escort.

**Material and method**

This prospective, randomized study was performed in 100 patients undergoing short surgical procedure like direct laryngoscopy and biopsy, oesophagoscopy, triplescopy, nasopharyngoscopy, node biopsy, wide excision, resuturing, flap cutting etc. After obtaining approval of ethical committee of institute, all patients were assessed as per the routine preoperative protocol. Investigations like complete blood count, urine routine, X-ray chest, HIV, HbsAg and ECG were performed. Patients of ASA grade 1 and 2 to be divided in two groups of 50 each.

Group 1: Patients received Inj. Propofol 1.5mg/kg and group II patients received Inj. Thiopentone sodium 5mg/kg i.v as induction agent.

Patients suffering from systemic disease like epilepsy, asthma, cardiac disease, diabetes, psychiatric illness, allergic to drugs, not nill by mouth and prolong procedure were excluded from study. A written informed consent of patients and relatives was obtained in vernacular language in each case. No sedative or narcotic premedication was given. Inj.Glycopyrrolate 0.2mg i.m. was given 30 minutes before the procedure. Patients were preoxygenated with100% oxygen for 3 minutes and induced with either Inj. Propofol or Inj.Thiopentone sodium intravenously. After loss of consciousness as evidenced by loss of corneal reflex Inj. Succinylcholine 1.5mg/kg was given and all patients were ventilated with 100% oxygen. Repeatation of anaesthesia was done with the same drug if needed as evidenced by light plane of anaesthesia. All patients were monitored with ECG and SpO2. After completion of procedure patients were assessed for the recovery. Phase 1 recovery time:- Discontinuation of anaesthesia to recovery of protective reflexes i.e. cough and gag reflex. Phase 2 recovery time:- In which patient assessed in recovery room with the help of the Modified Aldrete Scoring System. We observed and noted score at 0, 5, 10, 15 and 20 minutes. Total score of 10.

**The Modified Aldrete Scoring System**

- Activity: able to move voluntarily or on command

| | |
|---|---|
| 4 extremities | 2 |
| 2 extremities | 1 |

0 extremities 0

- Respiration

Able to deep breath and cough freely 2
Dyspnea, shallow or limited breathing 1
Apneic 0

- Circulation

BP ± 20 mm of preanaesthesia level 2
BP ± 20-50 mm of preanaesthesia level 1
BP ± 50 mm of preanaesthesia level 0

- Consciousness

Fully awake 2
Arousable on calling 1
Not responding 0

- $O_2$ saturation

Able to maintain $O_2$ saturation >92% on room air 2
$O_2$ saturation <90% even with $O_2$ supplementation 1
Need $O_2$ inhalation to maintain $O_2$ saturation >90% 0

We observed various complications like nausea and vomiting, pain, headache, difficulty in voiding urine, drowsiness and hangover. Patients were discharged after they have no complain at all and able to communicate and walk themselves with full orientation and after voiding urine. This time was noted as discharge time. Proper instruction regarding analgesia and oral intake of fluid and food and time to revisit was written on patient case paper and given to patients relative. Data calculation and p value calculation is done by unpaired t-test using online software from http://www.graphpad.com/quickcacls/ttest

## Results

We studied 100 patients for short surgical procedures in day care unit; divided in two groups. Patients in each group were comparable in respect of age, height and weight.

**Table 1: Demographic Data**

| GROUP | AGE (MEAN±S.D.) | SEX(M:F) | Duration Of Procedure |
|---|---|---|---|
| **GROUP 1(N=50)** | 52.52±13.38 | 37:13 | 8.71±2.02 |
| **GROUP 2 (N=50)** | 51.96±9.96 | 47:3 | 8.46±2.73 |

**Table 2: Phase 1 recovery time**

| | GROUP 1(MINS) | GROUP 2(MINS) |
|---|---|---|
| **PHASE 1 recovery time** | 8.77±1.66 | 11.18±2.61 |

Phase 1 recovery time is discontinuation of anaesthesia to recovery of protective reflexes. The difference in the time was statistically proven as p value is <0.0001.

**Table 3: Modified aldrete scoring system**

| TIME | GROUP 1 (mean aldrete score) | GROUP 2 (mean aldrete score) | P value |
|---|---|---|---|
| **0 MIN** | 6.34±0.97 | 4.77±0.97 | <0.0001 |
| **5 MIN** | 8.17±0.69 | 5.88±0.96 | <0.0001 |
| **10 MIN** | 9.71±0.25 | 6.88±0.87 | <0.0001 |
| **15 MIN** | 10±0 | 8.52±0.65 | <0.0001 |
| **20 MIN** | 10±0 | 9.87±0.33 | <0.0001 |

The score was earlier in group I than group II.

**Discharge time** for the group 1 varies from 110 mins to 160 mins having mean time was 136.95± 11.46 mins as compared to group 2 in which discharge varies from 135 mins to 190 mins having mean time of 164.4± 12.22 mins. P value is <0.001. The discharge time for the propofol group is earlier than the thiopentone sodium group.

**Table 4: Complications**

| | GROUP 1 ( No. of patients) | GROUP 2(No. of Patients) |
|---|---|---|
| PAIN | 23 | 28 |
| PONV | 6 | 11 |
| HEADACHE | 2 | 3 |
| DIZZINESS | 0 | 2 |
| HANGOVER | 0 | 1 |

In group 1 complain of pain, nausea, vomiting, headache found in 23, 6, 2 patients respectively out of 50 patients. In group 2 incidence of pain, nausea, vomiting, headache, dizziness, hangover was higher as 28, 11, 3, 2, 1 respectively.

## Discussion

The usual anaesthetic record provides only a few spaces in which to describe the physical status of the patient recovering from anaesthesia and those are usually inadequate. So Alderet and Kroulik devised a score in 1970 to provide objective information on the physical condition of patient arriving in the recovery room after anaesthesia. A method of evaluation of post anaesthetic patients had to be simple, easy to memorize and applicable to all situation, where a patient had received general, regional or intravenous anaesthesia. To avoid added burden to recovery room personnel, only physical signs that are commonly observed were considered. A rating of 0, 1 or 2 was given to each sign with total score of 10, which indicates a patient in the best possible condition [5]. One of the goal of our study was to determine factors that influence the speed of recovery and that may account for baseline variability and difference in the anesthesia; second goal of this study was to establish the importance of factor in determining discharge time relative to effect of the anaesthetic drug.

Phase 1 time is discontinuation of anaesthesia to recovery of protective reflexes is faster in propofol group than thiopentone group.

Hillel Kashtan and Joseph Mallon compared the propofol and thiopentone sodium for day care surgery and found that the mean time to awaken after discontinuing the infusion were 6.4±4.3 minutes and 13.9±15.9 minutes for propofol and thiopentone sodium respectively [6]. Gerald Edelist also did similar study and showed that mean time to awaken (phase 1) was 4.6 minutes for patients receiving propofol and 6.6 minutes for patients receiving thiopentone sodium [7]. Safudin Rashiq and Michael Grace studied thiopentone sodium, propofol and combination of both drugs and observe that phase 1 recovery was 8.1 minute, 6.75 minutes and 8.22 minutes respectively [8]. D. Latitha Devi studied that phase 1 recovery was less than 3 minutes in all the patients receiving propofol and it was upto 8.5 minutes in patients receiving thiopentone [9]. Our results are compatible with above studies.Modified Aldrete Scoring system used for phase 2 recovery and the score noted at 0, 5, 10, 15 and 20 minutes after shifting the patient to recovery area. We achieved score more than 9 or 10 within 10 minutes in propofol group and within 20 minutes in thiopentone sodium group. Patients achieve an alderet score of ten 22.6 sooner than those in thiopentone sodium[6]. H. Vaghadis and K Cheung in their study regarding day care anesthesia shown that they achieve modified alderet score >9 in 8.3±7.6 minutes. In addition 22%-25% of patients had modified alderet score of 9 and 10 respectively [10]. Dajun Song and Girish P Joshi in their study compare desflurane, sevoflurane and propofol for fast track eligibility after ambulatory anaesthesia achieved modified alderet score more than 9 within 15 minutes[11].In our study we found that the group which received propofol as induction agent has earlier discharge time with mean of 136.95±11.46 minutes as compared to the group given thiopentone it was 164.5±12.22 minutes. More number of patients in propofol group was able to pass romberg test and walk independently than thiopentone group [6]. D Janet and Suzanne in their study shown that recovery in the women in thiopentone induction, isoflurane maintainance would take 30 minutes longer than after propofol induction/propofol maintainance [12]. Saifudin and Michael in their study shown that mean discharge time for propofol group was 2 hours 40 minutes (±49 mins) compare to thiopentone group it was 3 hours 25 minutes (±58 minutes) [8].In group 1 complain of pain, nausea and vomiting, headache found in 23, 6, 2 patients respectively. In group 2 incidence of pain, nausea, vomiting, headache was 28,11,3 respectively. Two patients complain of dizziness and 1 patient complaining of hangover in group 2.Above results were comparable with the study done by Prof. Jyotsna Wig in their study 30-40% of adult patients complain of moderate to severe pain in first 24-48 hours, they also stated that PONV still remains big problem [1]. Postoperative pain is the most commonly reported complication of day care anaesthesia with up to 50% patients experiencing pain after surgery. They also observed PONV in 35% of patients[3]. Saifuddin and Michael found that vomiting present in 15% and 34% patients in propofol and thiopentone group

respectively. Pain seen in 50% of patients receiving propofol[8]. D Lalitha devi also studied post operative complications and shown that incidence of nausea vomiting is less in propofol group[9]. Hiller and Joseph also studied postoperative complication and found that dizziness sufficient prevent standing was present in immediate postoperative period in 53% of patients in thiopentone group versus 13% in propofol group. Higher incidence of nausea and vomiting was seen in thiopentone sodium group[6]. PONV may be reason for delay in discharge[10].The main medical factors identified by nurses as contributing to discharge delay in their study were uncontrolled pain, nausea/vomiting , drowsiness, unresolved block and inability to void[12].Propofol a intravenous hypnotic agent, undergoes rapid metabolism to inactive metabolites and has shorter elimination half life [9]. Propofol was associated with a shorter mean awakening time and shorter time to response to verbal command. It produces rapid, pleasant, safe anaesthesia with few side effects [10]. Recovery was very rapid and smooth. Incidence of nausea and vomiting is less in propofol group [9]. We noted that these pharmacokinetics characteristics make propofol a favorable agent for outpatient anaesthesia.

**Conclusion**

We studied discharge criteria and complications in day care surgery for comparison of propofol and thiopentone sodium as an induction agent. We concluded from this study; to enhance the recovery apply a range of multimodal strategies to prepare an optimize patients before, during and after surgery. To evaluate different factors for discharge criteria each anesthetist should develop technique that permits the patients to undergo the surgical procedure with minimal stress and maximal comfort. Patients should be admitted on the day of surgery with minimal starvation and preoperative analgesic drug. Proper preoperative preparation, intraoperative anesthetic management and proper monitoring enhance the recovery. The success of the day care surgery depends to a larger extent on both effective control of postoperative pain and minimization of the side effects such as sedation, nausea and vomiting. Propofol is safe anesthetic drug for early patients discharge in day care unit compare to thiopentone sodium.

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