

Modified PADSS (Post Anaesthetic Discharge Scoring System) for monitoring outpatients discharge



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The decision to discharge a patient undergoing day surgery is a major step in the hospitalization pathway, because it must be achieved without compromising the quality of care, thus ensuring the same assistance and wellbeing as for a long-term stay. Therefore, the use of an objective assessment for the management of a fair and safe discharge is essential. The authors propose the Post Anaesthetic Discharge Scoring System (PADSS), which considers six criteria: vital signs, ambulation, nausea/vomiting, pain, bleeding and voiding. Each criterion is given a score ranging from 0 to 2. Only patients who achieve a score of 9 or more are considered ready for discharge. Furthermore, PADSS has been modified to ensure a higher level of safety, thus the "vital signs" criteria must never score lower than 2, and none of the other five criteria must ever be equal to 0, even if the total score reaches 9.

The effectiveness of PADSS was analyzed on 2432 patients, by recording the incidence of postoperative complications and the readmission to hospital. So far PADSS has proved to be an efficient system that guarantees safe discharge.

KEY WORDS: Day surgery, PADSS, Safe discharge

Introduction

Day Surgery is convenient for patients. The simplification of the admission procedure and a shorter stay in hospital leads to less interference in patients' everyday life, and a faster return to the comfort of their own homes. This also reduces the risk of severe postoperative complication such as cross-infections and venous thromboembolism.

However the quality and safety of day surgery services must be as high as those provided for long term hospitalization. Moreover, the assessment of the patients should not rely on empirical and personal impressions, but clear and evidence-based discharge criteria should be used to ensure that patients are able to make a safe recovery.

The discharge criteria should be effective, objective and easy to detect. The assessment, moreover, must be suitable to be carried out not only by the surgeon and the anaesthesiologist, but also by the attending nurse.

The Post Anaesthetic Discharge Scoring System (PADSS)¹, is based on the assessment of six criteria: vital signs (including blood pressure, pulse, temperature and respiratory rate), ambulation, nausea/vomiting, pain, surgical bleeding and fluid intake / output. Each criterion is given a score going from 0 to 2. Only patients who score 9 or higher are considered to be ready for discharge.

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The effectiveness of PADSS has been assessed, as primary endpoint, by monitoring the incidence of postoperative complications after discharge for 7 days after the patients' arrival home. In order to define unwarranted long term hospitalization, unanticipated admissions and their causes were also considered.

Material and methods

From January 2009 to December 2011, 2432 patients, selected according to the International guidelines 2 were treated in our day surgery unit. Exclusion criteria included body mass index (BMI) >30, history of drug/alcohol abuse, psychiatric disorders and, at last, a not-acceptable home support. Only patients with ASA score ranging from 1 to 3 were admitted (Table I).

The study was performed on 1337 males and 1095 females, with an average age of 46.7 (range 17 – 88), who underwent different types of surgery (Table II).

After the surgical treatment, all patients were considered appropriate for fast-tracking, and PACU was by-passed. The PADSS discharge criteria had been modified restrictively: the "vital signs" criteria could never be below 2, and none of the other single criteria could be equal to 0, even if total score was 9 or higher, at the time of discharge. For instance, a score equal to 10, with a single criteria scoring 0, was a poor indicator for safe discharge.

Two hours after surgery the nurses of the unit filled in a PADSS questionnaire (Table III), which was also checked by the surgeon and the anaesthesiologist. Patients who scored 12 or 11 were considered to be ready for an immediate discharge.

Therefore, patients who did not attain an adequate score initially were assessed again after two hours; if the assessment still generated a poor score, they were considered for admission to a ward.

Patients were contacted by phone 24 hours after discharge in order to monitor the postoperative course, to detect any problems or complaints and to note down possible complications. During the following days they returned to the hospital for check up and medications, until they had recovered fully.

The PADSS and the patients' discharge outcome were related to the ASA score.

TABLE I - *American Society of Anesthesiologists (ASA) Score*

ASA 1	A normal healthy patient.
ASA 2	A patient with mild systemic disease.
ASA 3	A patient with severe systemic disease.
ASA 4	A patient with severe systemic disease that is a constant threat to life.
ASA 5	A moribund patient who is not expected to survive.

Results

The ASA score resulted equal to 1 in 51.3% of the cases (1248), equal to 2 in 40.3% of the patients (980), and to 3 in 8.4% (204 cases).

Most of the surgical treatments (96.5%) were performed with local anaesthesia + analgesia/sedation. The skin was treated previously with EMLA® (lidocaine + prilocaine cream). Only 86 patients were treated with laryngeal mask anaesthesia.

Two hours after surgery, the nurses filled in each patient's PADSS questionnaire: 1843 patients (75.8%) obtained a maximum score of 12, and 365 (15%) scored 11. Six patients showed light bleeding, 36 complained of mild nausea, 15 suffered from problems with urination, two had difficulties with ambulation and 306 reported moderate pain.

153 patients (6.3%) scored 10, and seventy one (2.9%) scored 9. They underwent a further assessment after two hours, when everyone except 44 had a good score. Particularly 141 cases scored 12 and 39 scored 11, all complaining of moderate pain.

The patients who still scored 10 (36 cases) or 9 (8 cases) were reassessed by the surgeon and the anaesthesiologist. Five of them who scored 10, due to nausea + light pain, were able to be discharged, as was a further patient who complained of dysuria and slight nausea. Thirty cases instead were not discharged, but were transferred to a long-stay unit. Two of them had bleeding from the surgical site and were transferred to the operating room for a surgical second look, one suffered from serious nausea and vomiting (after general anaesthesia) and 27 complained of severe pain, some of whom were unable to walk.

Eight patients scored 9; six of them suffered from moderate pain and severe hypertension and/or arrhythmia and required unanticipated admission: four scored ASA 2 and two scored ASA 1. Two other patients with severe pain and moderate nausea (ASA 2) also required hospitalization.

The results are summarized in Table IV.

Two patients (both PADSS 11) asked for a doctor to visit them at home. One of them became dizzy when

TABLE II - *Surgical Intervention*

Inguinal hernia repair	825
Abdominal wall hernia repair	341
Varicose veins treatment	603
	(38 Endo Vascular Laser Treatment)
Plastic surgery	158
Breast surgery	186
Sinus Pilonidalis excision	126
Proctological surgery	131
Other	62
Total	2432

TABLE III - Post Anaesthetic Discharge Scoring System (P.A.D.S.S)

Name
Surgical Treatment
DateTime from surgery
Vital Signs (blood pressure, pulse, heart rate)
0 = >40% of preoperative value
1 = 20 - 40% of preoperative value
2 = < 20% of preoperative value
Ambulation
0 = difficult / impossible
1 = toddle
2 = steady
Post-operative nausea /vomiting (PONV)
0 = severe
1 = moderate
2 = minimal
Pain
0 = severe
1 = moderate
2 = minimal
Surgical bleeding
0 = severe
1 = moderate
2 = minimal / absent
Voiding
0 = retention
1 = difficult
2 = normal
Total =

moving from a supine to an upright position, and the other had noticed testicular swelling after surgery to groin hernia repair. Neither required treatment.

In none of the above cases was any complication highlighted in the short term that required re-hospitalization after discharge, except for a 69-years-old woman who suffered a transient ischemic attack, and a 38-years-old man who observed moderate bleeding after haemorrhoidectomy. They were readmitted to hospital six and three days after discharge (0.12%).

Discussion

In Day Surgery the quality and safety of services must be as high as those provided during long-stay hospitalization and several procedures can be used to check and ensure such levels of safety ³.

At the time of the discharge it is extremely important to consider any information regarding the postoperative

course, in order to identify possible severe complications. The availability of day surgery medical staff must be guaranteed after discharge, and the patients' social factors must also be considered (telephone availability, need for transportation and family support at home) ⁴.

A follow-up check, performed by telephone call or visits, facilitates the patients' postoperative care and is effective in the detection of complications. A low number of postoperative complications is associated with strict pre-admission screening and a well organized discharge procedure.

As Day Surgery begins to include major operations, which involve higher risks and increased complications, the highest levels of quality and safety standards must be maintained.

Appropriate selection of patients must be carried out, and expert surgeons are required to perform operations with minimal trauma. Improved local anaesthetic techniques and new medications with rare side effects, help to ensure that rapid postoperative discharge is possible. A very important step in this phase is establishing the correct time for discharge, considering the patient's ability to recover after surgery and anaesthesia.

Currently there are many discharge criteria in clinical use. The Aldrete scoring system ⁵ includes five key parameters: respiration, O₂ saturation, consciousness, circulation and activity. It is a modification of the Apgar scoring system, and seems to be more useful in the assessment of patients' transition from phase I to phase II recovery (from emergence from anaesthesia to the return of protective reflexes and motor function) ⁵, rather than the evaluation of readiness for discharge. The psychomotor tests ⁽³⁾ do not take into account parameters such as pain, bleeding and nausea/vomiting. In Addition, the R.E.A.C.T assessment (respiration, energy, alertness, circulation, temperature) ⁵ is not effective in the assessment of bleeding, difficulty in ambulation and nausea/vomiting, which can occur in patients undergoing day surgery. Furthermore, Swan & coll ⁶ describe change in symptom distress that can occur up to seven days after surgery. In their study, two measurement devices were considered, the General Symptom Distress Scale (GSDS) which scores 11 symptoms, and the Functional Status Questionnaire (FSQ), which assesses physical, psychological and social function. The study, however, was not effective in identifying an instrument to assess readiness for discharge.

In contrast, PADSS revealed, in our experience, an efficient evaluation of criteria for safe discharge in day surgery. It has received the acceptance of the Joint Commission for Accreditation of Healthcare Organizations (JCAHO), it is easy to perform, suited to all cases and can also be used to measure changes in patients' health. A limitation of PADSS may be that it is not sensitive to the surgical procedure ⁵. Furthermore, it can be difficult to assess some frail or elderly patients who have abnormally elevated values (for instance of vital signs) already in the preop-

TABLE IV

PADSS score 2 hours after surgery	Patients	ASA score	Cause	Outcome
	2432			
12	1843	ASA 1= 1016 ASA 2= 731 ASA 3= 96		discharged
11	365	ASA 1= 149 ASA 2= 157 ASA 3 = 59	light bleeding (6); mild nausea (36); urination problems (15); toddle ambulation (2); moderate pain (306)	discharged
10	153	ASA 1= 52 ASA 2= 70 ASA 3= 31		reassessment at 4 hours
9	71	ASA 1= 31 ASA 2= 22 ASA 3= 18		reassessment at 4 hours
PADSS score 4 hours after surgery	224			
12	141	ASA 1= 38 ASA 2= 68 ASA 3= 35		discharged
11	39	ASA 1= 22 ASA 2= 5 ASA 3= 12	moderate pain - score 1(39)	discharged
10	6	ASA 1= 2 ASA 2= 2 ASA 3= 2	Nausea + light pain - score 1+1(5) Dysuria + light nausea - score 1+1(1)	discharged
10	30	ASA 1= 19 ASA 2= 11 ASA 3= 0	Bleeding - score=0 (2) Nausea and vomiting - score= 0 (1) Severe pain - score= 0 (27)	unanticipated admission
9	8	ASA 1= 2 ASA 2= 6 ASA 3= 0	moderate pain + hypertension and/or arrhythmia - score= 1+0 (6); Severe pain + nausea - score= 0+1 (2)	unanticipated admission

erative phase. It is also important to note that scoring criteria do not replace the professional judgement of physicians and nurses, and it is only part of the discharge assessment ⁵.

On the day after discharge we contacted our patients in order to monitor their postoperative course, take note of possible complications, and evaluate the patients' surgi-

cal experience and outcome. This procedure, in accordance with other Authors ^{7,8}, has proved useful for the assessment of the effectiveness of PADSS.

Within the 6 key parameters assessed by PADSS, we believe that it is essential to make some important changes. Patients must not be discharged with a score lower than 2 for the "vital signs" criteria, in order to

avoid an increase in postoperative risk. Furthermore, a patient who scores 0 for any of the other criteria should not be discharged. For instance, a score for "bleeding" equal to 0 indicates a severe haemorrhage, and such a patient can not be discharged even if its total score is¹⁰. Likewise, ambulation must be possible, and severe vomiting should prevent discharge⁹. This is in accordance with Truong and Coll.¹⁰, who emphasize that a score 0 for any clinical category is unacceptable for discharge, irrespective of total score.

We suggest that patient should be required to void before discharge, whereas some Authors state this unnecessary¹¹⁻¹³. Instead, we believe that urinary retention could be a cause of re-hospitalization a short time after discharge. The anaesthetic technique is maybe an important determinant of discharge time^{13,14} but in our study, owing to the common use of local anaesthesia, this indicator was not generally relevant. In addition, the ASA classification of patients has been revealed not to be predictive of duration of hospitalization¹¹. In our experience none of the patients who required admission had an ASA score of 3.

Many patients discharged with a score of 10 or 11 had achieved a score like 1 for the "pain" criteria. Pain is unquestionably the most common postoperative complication, even if it is often poorly considered^{15,16}, and it must be treated immediately after surgery, as well as during the stay at home. It is not permissible to send patients home in pain and recommending them simply to take analgesic drugs when needed; in fact this may compromise the whole outcome of the surgical procedure.

Riassunto

La decisione di dimettere un paziente operato in Day Surgery è un momento importante nel processo di ricovero perché deve essere presa senza compromettere la qualità dell'assistenza, che deve essere sovrapponibile a quella di un ricovero ordinario di più lunga durata. Gli autori propongono un sistema di punteggio post-anestesia ai fini della dimissione che prende in esame 6 criteri: segni vitali, deambulazione, nausea/vomito, dolore, sanguinamento ed evacuazioni. A ciascun criterio viene attribuito un punteggio da 0 a 2. Solo i pazienti che raggiungono un punteggio di 9 o più vengono considerati pronti per la dimissione. Questo sistema di punteggio, inoltre, è stato modificato per assicurare un più elevato livello di sicurezza, pertanto il criterio "segni vitali" non deve mai raggiungere un punteggio inferiore a 2, mentre nessuno degli criteri deve avere un punteggio di 0, anche se il totale dovesse raggiungere 9.

L'efficacia di questo sistema di punteggio è stato analizzato in 2432 pazienti, registrando l'incidenza delle complicanze post-operatorie e dei nuovi ricoveri in ospedale. Il sistema si è rivelato, finora, un mezzo efficace nel garantire una dimissione in sicurezza.

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