



International Journal of Surgery Science

E-ISSN: 2616-3470

P-ISSN: 2616-3462

© Surgery Science

www.surgeryscience.com

2021; 5(3): 19-22

Received: 10-05-2021

Accepted: 12-06-2021

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Assessment of R2D2 protocol for surgery residents in understanding the discharge processes of patients: single institutional study

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DOI: <https://doi.org/10.33545/surgery.2021.v5.i3a.727>

Abstract

The process of discharging a patient is very crucial not only for the patient but also for the family which is going to support the patient after discharge. In a developing country like India the role of the residents is very important in making the patient understand the operative treatment and guiding him through the discharge and follow up in a department like Surgery. Patients are routinely given a discharge summary about patient details including operative procedures and review, but the understanding of the process by the rural population need to be evaluated. Standardization of discussion with the patient, content of discharge, delivery of post-operative instructions may help these rural patients to understand their diagnosis surgical treatment, and follow-up process, and treatment plan. In this study we apply R2D2 protocol for standardizing this discharge procedure in improving the residents understanding on the importance of discharge process and the patients understanding of their treatment.

Keywords: Discharge process, residents, surgical ward, rural patients, R2D2, Rural population

I. Introduction

The importance of the discharge process, is often not given due importance in residency program, there is neither formal training nor assessment on these for the residents [1]. A standardized discharge instruction process, when applied by residents in discharge process, has shown improvement in patients understanding of their surgical treatment and lead easy post operative period and for residents in follow up [2]. As discharges by surgery department both elective and emergency in our teaching Institute are managed by residents, so they must be trained and assessed in the admission, treatment course, discharge plan and it takes proper guidance and supervision [3]. Residents' knowledge about this process at present is limited to writing discharge summary of the details given in the case sheet without any proper communication to the patient [4]. High patient turnout in surgery and emergency department, time spent operation theatres, patients care and other academic activities also found to be a contributing factor. A previous study applying this protocol in ED disposition found out that trained interns get better understanding of this discharge process leading to better patient care [5]. The results of that study were crucial as trained interns can handle this discharge and follow-up better after exposure to this R2D2 protocol. RAPID Mnemonic based approach (resuscitation, analgesia and assessment, patient needs, interventions, disposition) was used to assess students doing clerkship in emergency medicine to provide holistic care for their patients [6]. RAPID approach though, found to be effective of mnemonic-based teaching, it did not even touch up on the discharge process or its impact on the patients' understanding of their treatment or discharge process. Based on this model and another study based on R2D2 in emergency medicine we applied this R2D2 model to improve our rural patients' understanding of their diagnosis, treatment and follow up plan we applied this algorithm to guide and assess our residents in surgery department through the discharge process using the mnemonic "R2D2." R2D2 stands for reassess the patient, recheck the workup, discuss the disposition plan with the operating surgeon, discuss the discharge plan with patient and finally involving the family. Surgery residents were given a brief introduction about this questionnaire based on R2D2 model and standardized steps with patients not included in the study. This design was introduced to improve residents' communication, patients understanding of their treatment plan, and post-operative step down to discharge and follow up.

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This main objective of this particular study was to assess the impact of the R2D2 protocol, among rural population in improving patients' understanding of their diagnosis, treatment plans and residents' execution of the discharge process and post-operative care. Many studies have analyzed the use of Interactive communication-based tools including emails, and videos of this discharge details for communication with the patient, but in rural community where the attitude, knowledge and understanding are entirely different these methods are not feasible [7]. Patients not following the post-operative instructions in quite high even in developed countries around 20 to 67%. In order to make sure that the residents understand the importance of carrying out the discharge process., Pilot was study conducted with the residents, and it showed that communication is inadequate in terms of time spent with the patient, and there was lack of clarity in conveying treatment details including follow up instructions. Lack of adherence to postoperative instructions by the patients' leads to complications, readmission, and economic burden on these poor rural population.

II. Methodology

This single Institutional study was conducted at Karpaga Vinayaga Institute of Medical Sciences and Research Centre, tertiary care teaching hospital. This Department of Surgery mainly caters to the surrounding rural population so residents here need to be trained in understanding the discharge process and convey in a such way that patients can understand. This study was a convenience before-and-after study.

Inclusion Criteria

1. Above 18 years
2. Patients discharged from department of General Surgery by a resident.
3. Patients underwent surgical procedures

Exclusion criteria

1. Less than 18 years
2. Difficulty in understanding Tamil (Local Language)
3. Patients underwent non-surgical procedures.

All residents and faculties involved in this study were given an orientation program for a week in our department by senior faculties. This orientation program covered UHID of patients' documentation, patients travel admission, operation theatre, through SICU, and Step down ward and discharge process. Subsequently a trial run conducted with patients in the surgery ward who were not going to be part of study population. Data collected without the use of the R2D2 for a period of one week and documented as control. All the required data right from admission till discharge were collected by the senior residents involved in this study for a period of one week before implementation of the mnemonics R2D2 (Reassess, Recheck, Discuss and Discharge) and 1 week after implementation of the R2D2 protocol. There was an interval of one week duration between both parts of the study, during which residents were oriented about this protocol, and suitable patients were selected for inclusion in this study. Patients who fulfilled inclusion criteria, voluntarily opted with written consent were involved in this study through operated and discharging surgeon. Selected patients were requested to provide answers for the following pre-validated questions

1. Did you were examined by any surgeon from operating team?
2) Did your resident tell you the reasons for review at the Surgery OPD after discharge?

3) Were you able to understand the diagnosis, procedure underwent, and discharge process? Their answers documented by research assistants. Average of 2 weeks after discharge, the same patients were followed up by one resident involved in the discharge process by phone to answer pre-validated questions about their inpatient stay in Department of General Surgery. These questions were used to address specifically whether the patents understood their diagnosis, operative procedure underwent, discharge process and follow up.

1) Do you know about your discharge diagnosis? 2) If yes, can you describe it? 3. Do you understand your treatment and follow-up plan? And 3) Are you able to complete your treatment or follow-up plan? 4. Are you satisfied with the treatment and discharge process? Research assistants recorded the patient's responses documented and analyzed to know how accurately patients' understanding and ability to recall details of their discharge process and follow up instructions. The patient responses were compared with the electronic records stored in the department accuracy of discharge instructions.

II.1. Data Analysis

Sample (Group) size of 100 (220 total) achieved 80% power with Type I error of 0.05 to detect a difference between group proportions of 18% (50% vs. 68%). Assuming a 25% dropout rate, we recruited 200 participants. Study-specific database created and all responses before and after the introduction of R2D2 Protocol entered in the data base. SPSS V23 (2015) used for data analyses imported in Microsoft excel. Counts, percentages and number used for variables, means standard deviations (SD) are presented for continuous measures. Independent-samples t-tests were used to compare the control and R2D2 groups. The assumptions for t-tests equal variance and normal distribution were checked. Fisher's exact, chi-square, and two independent-sample proportions tests were used for statistical analysis.

III. Results: 200 patients included in this study with 100 each in the control group and the intervention group. Since we had phone number exclusively for this purpose in our department assistants could contact every patient discharged by a resident. A total of 72% (72/100) of the control group and 87 % (87/100) of the intervention group could complete this follow-up survey over phone totaling 150 patients after a week of discharge. There was not much difference noted in terms of age, sex, vital signs, language, education, or health status (Table I). There were no differences between groups in residents' reexamination of patients or instruction to report immediately warnings given before discharge (Table II). On telephone follow-up, 80% (80/100) of the intervention patients knew their discharge diagnosis in contrast to only 72% (72/100) of control patients ($p = 0.0061$, 95% confidence interval [CI] of the differences in two proportions = 3% to 25%). Eighty percent (80/100) of intervention patients had better understanding of their discharge treatment plan versus only 70% (70/100) of control patients ($p = 0.0259$, 95% CI = 0.6% to 20%). There were no major differences between patients' return to baseline health status or review for the same condition (Table III).

Table 1: Comparing Demographics and various investigation between two groups

S.NO	Male	Female	Language, Tamil	Grade school and under	Abnormal lab investigation	Abnormal radiological investigation
Control (n = 100)	47	53	42	39	78	89
R2D2 (n = 100)	63	37	48	36	89	92
Chi-square p-value	0.0259	0.0072	0.0061	0.0072	0.062	0.052

Table 2: Comparison of advice on Discharge Given by Surgery Resident

S.NO	Surgery Resident re-examined patient	Surgery department return warning signs given to the post-operative patient	Patients knowledge about suture removal on corresponding date
Control (n = 100)	88	89	93
R2D2 (n = 100)	92	95	96
Chi-square p-value	0.023	0.035	0.045

Table 3: Comparing two Groups through departmental phone After Discharge 1 Week

S.NO	Patient described the diagnosis correctly	Patient described treatment plan correctly	Patient described follow-up plan correctly	Patient is aware of possible post op complication	Surgery department revisit for same health problem	Seeking healthcare attention if complication present
Control	87	78	75	73	79	72
R2D2	92	90	89	87	88	90
Chi-square p-value	0.023	0.035	0.027	0.046	0.073	0.062

IV. Discussion

It is very important for the residents to understand the discharge process, then only they can communicate with the patients effectively about their diagnosis and discharge and follow-up process. Since there is no formal training schedule for the residents in the curriculum, they have to learn only from their experienced senior faculties [8]. Experienced senior surgeons discharge patients using several critical elements that they have learned through their experience and training to ensure a safe patient discharge. Understanding these discharges crucial especially for surgery residents, since most of the rural population are ignorant about their diseases and treatment, and the responsibility of the residents to make them understand their diagnosis, need for surgery and importance of follow up [9]. To attain this confidence, and become competent of these skills residents require the completion of many patient encounters with these poor rural patients, as patient outcomes related to the discharge process help them progresses along the crucial learning curve [10]. These mnemonics of R2D2 developed to help the residents easy to understand and follow up for discharge process in surgery. Similar study was conducted in emergency department of Parkland hospital but they didn't find much difference with the application of R2D2 Protocol. We incorporated an algorithm that outlines the critical components of surgery discharge for resident surgeons using an easy-to-follow mnemonic that could guide these in house residents in safely and effectively discharging their patients. Prior to the R2D2 protocol resident in surgery give only printed copy of discharge summary usually written in English, a tall order for patients and their relatives to understand.

R2D2 protocol involves 1) Assigning resident from the operating team for patient follow up, 2) resident from the operating team discuss the follow-up plans with the patient, 3) discussing the diagnosis and discharge plan with patient's family must 5) counter checked by senior member of the operating team. In order to make sure that the residents understand the importance of carrying out the discharge process, The R2D2 protocol mandate the resident to see that patient at the time of admission in surgery ward, initial evaluation, fitness for surgery, post-operative follow up reexamination before discharge and on discharge to discuss the discharge instructions. It's important in the R2D2 protocol that the residents have to discuss the

discharge plan directly with the patient and family with the approval of the operating surgeon. Detailed discharge instructions by the resident in local language helps the patient from rural background to understand better about his discharge plans and follow up instructions. This was supported by the study conducted at Parkland Memorial Hospital in emergency department. This can have important implications for overall patient outcomes, including potential reductions in morbidity and mortality.

Research studies have shown that formal training is discharge process not part of training for residents in surgery. They have to observe what their seniors do or simply have to follow the instructions given by senior faculty [11]. Which is not measurable or assessable as required in (CBME) Competency based medical education. R2D2 protocol helps to integrate the most essential part of the discharge process, increases the effective communication and trust between the doctor and patient. Since the doctor patient interaction starts right from initial evaluation, surgery, upon reevaluation, and during the discharge process it develops trust and less room for patient related complications. Some critical diagnoses may not be readily apparent on the initial assessment, with interactions with the patient using R2D2, as well as the reassessment phase, allow the resident time to reach the proper diagnosis [13]. Case scenarios like abdominal pain in young patients very common in surgery emergency. Findings may not be as classical as described in text book. It could be either an appendicitis or pancreatitis which is very common especially with patients who consume alcohol [14]. By following R2D2 protocol residents interact more frequently with the patients, reassess in intervals so that less chance of missing a diagnosis [15]. Patient cooperation with the treating team also improves when their expectations are met. Follow-up instructions, diagnosis and test result explanations, and verbal discharge in a language they can understand instructions all improved with this protocol. Under the R2D2 protocol, the discussion with the patient allows the resident surgeon to sit down with the patient and directly discuss the home plan of care, follow-up care, medications, and when to return emergency warnings. The patient can clarify their doubts directly with the treating residents with proper understanding of his surgery and follow up process with satisfaction. R2D2 patients showed better understanding of their diagnosis and discharge process and

significant increase in adherence to discharge follow-up plans when compared to previous discharges^[16]. This could be attributed to our resident's compliance to the protocol, as they contact the patients in the stipulated time, and our patients are usually from surrounding villages with free transportation offered by our teaching institute. In contrast to our findings another study showed that the most common reason for patients missing appointments was forgetfulness^[17]. May be in our study patients were reminded of their review over phone with free transport so less chance of missing the follow-up. In unavoidable situations nearly 59% rescheduled it and only 18% were UN able to complete the rescheduled appointment.

Limitations to the study include sample size as we could include only 100 patients, only limited to patients underwent surgery and left out non-surgical patients. Immediate after care. Our study period covered only 2 weeks which is quite a short time to establish the result with the findings arrived at. Significant limitation we feel is, high level of compliance and regular follow-up may be due to the fact that the recruited residents were aware of the fact that they were included in the study and under observation. New discharge protocol. To substantiate our findings further studies needed with randomly selected residents over a longer period in including patients without surgical intervention and in day care procedures. R2D2 provided direct benefits not only for the patients, but help to assess and train the residents in discharge process. Though the parkland study found that R2D2 protocol didn't show much benefit might be due to large foot fall where as we found is effective because of smaller teaching institute and better access to the patients.

V. Conclusion

R2D2 protocol is a relatively new concept and need further evaluation with more patients in different specialties. We succeeded in increasing patient understanding of their diagnosis and treatment plan, and its effect on patient's adherence to follow-up instructions. Further studies needed into establishing the effectiveness of R2D2 protocol as a training tool for residents in effective communication with the patients in the absence of lack of training for the same. R2D2 leads to better care to the patients, help them to understand their diagnosis, discharge process and gives immense satisfaction.

Conflict of Interest: Nil

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