

Research Article

Managing a surgical unit using google drive - a feasibility study

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ABSTRACT

Background: Managing a surgical unit can be a daunting task. Being a consultant in a teaching hospital only adds to the challenge. One of the main challenges in running a unit is to have an effective channel of communication between the various members of the surgical team. Many medical errors have their origin in the lapse of communication. We are living in the era of telecommunication explosion where we have access to innumerable instruments of communications, all converged into a single device - "The Smart phone". In this article we present the various challenges that are faced by a surgical unit and how a simple free to use software can be used to overcome some of those challenges.

Methods: Electronic patient management software was created with the google drive software which is free to use. It was used to prepare various documents involved in the management of a surgical unit such as operation theatre list, Operation notes, Discharge summary and the team members were given a questionnaire regarding the ease of use of the software. The average time taken and the data usage for each of the activities were calculated.

Results: A total of 30 residents and interns who worked in the unit during the study period answered the questionnaire. All the members of the team adapted favourably to this system. The cost involved and the data usage are minimal.

Conclusions: It is feasible to use google drive as a patient management system by a surgical unit to organise work. This system is efficient, secure and cost effective.

Keywords: Electronic medical record, Google drive, Smart phone

INTRODUCTION

Managing a surgical unit is a very challenging task. It involves coordination of various activities relating to patient care, managing academics and research. Effective management of these activities requires above all else effective communication between the team members, lack of which is one of the chief causes of medical errors. Various management software's are available to tackle this critical issue.¹⁻³ These software's are often cumbersome to handle and involve the use of a computer belonging to the hospital and are expensive both to procure and to maintain.^{4,5} Surgeons are reluctant to use these hospital management software's because it involves

a visit to a dedicated computer which will be available in a certain location only.^{6,7}

With a view to overcome these difficulties we devised and present here a simple, free to use, effective tool that can be accessed on any mobile phone from any part of the world where an internet connection is available.

METHODS

We use the Google Drive software which can be accessed on any of the computing devices, either a laptop, android phone or an apple device with an internet connection. All the members who intend to use this software should have

or create a gmail account and download the Google Drive software into their device.

One of the members (The administrator) will create a new spreadsheet in the Google Drive and share it with the members. The administrator can decide if the members have the right to edit the document or just view it. Any number of members can be added or removed by the administrator. Once this is done, the various activities of the surgical units can be managed effectively as detailed here. The members of the team were asked to answer a questionnaire regarding various aspects of the use of this software at the end of 2 weeks and 4 weeks.

They were asked to score the parameters on a scale of 1 to 10 where a score of 1 denotes very difficult and a score of 10 representing very easy. The amount of data used by the software was calculated using data management software. The cost was calculated at the rate of Rs. 265 of 1 GB of data.

Managing the active patient list

This is the main stay use of this system where at a glance, all the members of the unit can see and manage the patients who are admitted in the unit (Figure 1).

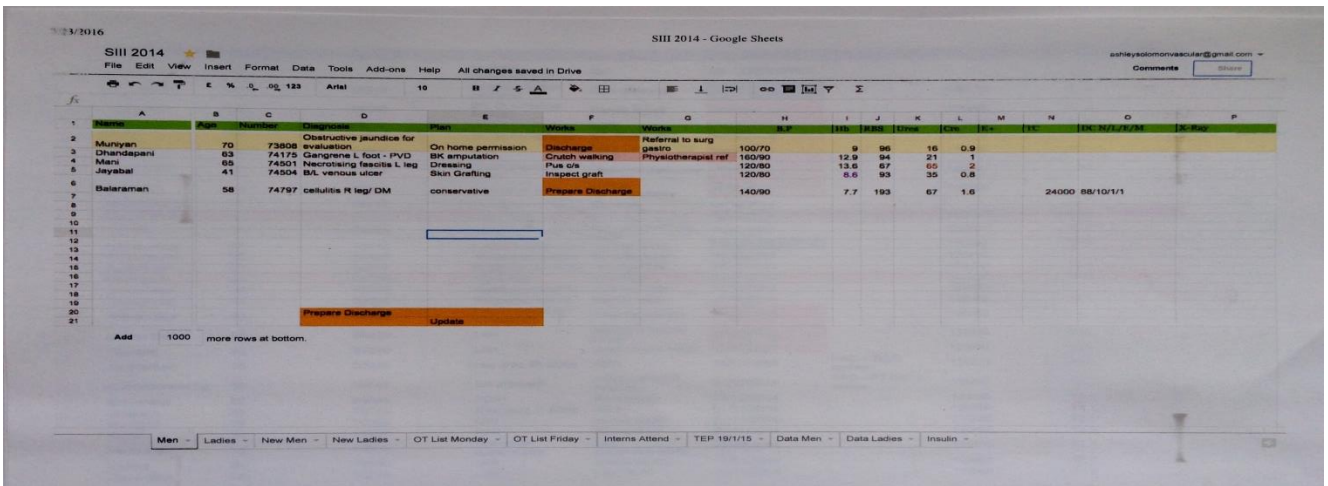


Figure 1: Screen shot of the patient list sheet (names changed).

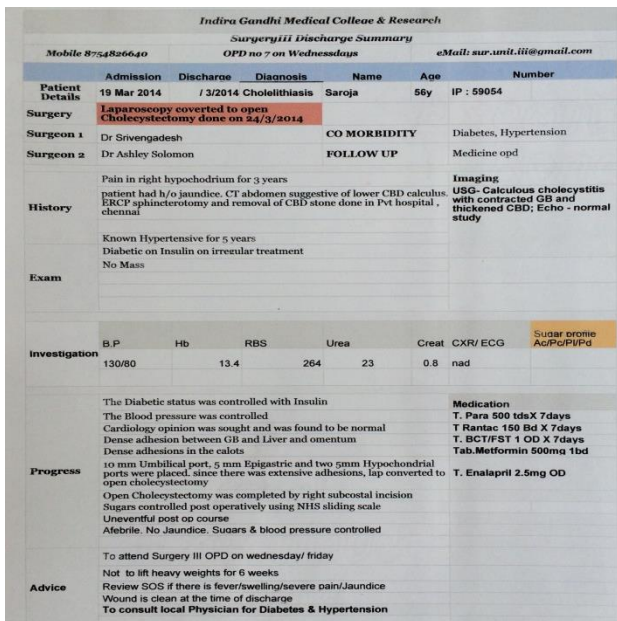


Figure 2: Photo of the printout of the discharge summary generated using google drive sheet.

This spread sheet will have details like the diagnosis, the plan, the works that are to be done and the results of some of the important investigations.

The spreadsheet can be edited by the members. Using this one can plan the OT list, Discharges, Order investigations to be sent by team members etc. We can have separate spreadsheet for each of the wards like for an example one for the male and one for the female ward.

When a patient gets discharged the entire row that contains the patient details can be cut and pasted in a new spread sheet which will now serve as the database for all the cases that are treated by the unit.

Preparing a discharge summary

Another use of the system is to prepare discharge summary. One of the sheets can be formatted to be a discharge summary with all the details that are needed like the hospital details, patient details, details of investigations etc. (Figure 2).

The junior doctors can type out the details which can be edited by the senior consultants. Once the discharge summary is perfected it can be printed out to yield an elegant printout and can also be stored as a PDF for future reference.

This sheet can serve as a template for future discharge summaries. A new sheet can be opened for each of the cases like a Thyroid, Hernia, and Breast etc. thus making the process of preparing a discharge summary easy, effective and easily achievable.

The operation list

We formatted a sheet as a operation list as shown in the Figure 3. The patient details from the master list can be copied and pasted onto this sheet thus creating an operation list effortlessly.

The order of surgery can also be changed easily if so desired. Since the list is in digital format it can be emailed to all the concerned personnel.

Date	12/01/2015	Indira Gandhi Medical College & Research Institute, Pondicherry					Dr Ashley Solomon Dr Sri Vengadesh	
Unit	Surgery III	Operation Schedule						
s.no	Name	Age	Number	Diagnosis	Surgeons	Plan	Ward	Anest
1	Mariyammal	62	74147	Ca rectum	Abdomino Perineal resection		FSW	GA
2	Dhandapani	63	74175	Gangrene L foot - PVD	BK amputation		MSW	GA/IFA
3	Jayabal	41	74504	B/L venous ulcer	Skin Grafting		MSW	GA/IFA
4								
5								
6								
7								
8								
9								

Figure 3: Operation theatre list generated using google drive (names changed).

Surgerv III OT NOTES

Indira Gandhi Medical College, Kadhirkammam, Pondicherry

Diagnosis	Name	Age	IPNO
Partial Gasterectomy		12 Mar 2014	

Surgeon 1 Dr Ashley Solomon
Surgeon 2 Dr Srivengadesh

Anesthesia SA
Anesthetist Dr Deesak Paulose

Nurse Ms. Evanzeline

Findings
No peritoneal / Liver mets / coeliac nodes / para aortic nodes
10 cm tumor occupying antrum
Distal and proximal stomach free of tumour
Enlarged pre pyloric and omental nodes
Filmy adhesions to pancreas, tumour infiltration into lesser omentum is noted
No infiltration of other surrounding structures

Procedure
Mid line laparotomy following diastotic laparoscopy
Lesser sac entered by detaching the omentum from the transverse colon
Mass dissected free from the pancreas and epiploic vessel were controlled
Lesser omentum was detached from the liver and portal triad and left Gastric vessel was controlled
The first part of duodenum was transected and suture closed with two layers 3-0 PGA and silk sutures
The defect was closed in two layers with 1 prolene,
Prosthetic mesh was not used in view of the presence of dirty fluid
The Umbilical hernia was repaired with 0 prolene
The proximal stomach was transected 5 cm proximal to the tumour margin
The gastric remnant was reconstructed with a ante colic isoperistaltic Hoffmeister GJ
Drains were placed in morrison and the abdomen was closed

Figure 4: Picture of the sheet generating the operation notes (names changed).

Preparing a operation record

One of the sheets was formatted as an operation record with all the relevant details as shown in the Figure 4. This record can be modified by all the members of the team and once found to be perfect it can be printed and also saved in a digital format for future reference.

Preparing check lists

The master patient list can be used for creating check lists. For example to see if the biopsy report has been

collected or if the patient has been appropriately referred for further follow up treatment etc.

Name	Age	Number	Diagnosis	Plan	Discharge		
Jayaraman	65		perianal Abscess/SCU	ISD	M3 TAKEN OVER		
Annavaasal	50	68616	wound infection genitalia	Conservative	27/02/2014	100/70	11.6
Jayaraman	60	68349	B/L Umbilical hernia	Hernia repair	Med take over	120/80	11.9
rajumar	31	68114	Raw area R.LL	SSG	04/10/2014	120/70	12.5
Mano	15	68643	B/L gynecomastia	B/L Websters	30/09/2014	110/70	11.5
Ramesh	30	68608	RIH	Laparoscopic Top repair	30/09/2014	110/70	13
Subramani	63	68373	Thrombosed Ext piles	Hemorrhoidectomy	30/09/2014	120/80	13.9
Selvaraj	45	68640	Fissure in ano	Lateral Sphincterotomy	30/09/2014	120/80	
Maheshwaran	47	68637	Plunging fistula	Excision	04/10/2014		13.5
Maheshwaran	65	68606	B/L Hernia	Laparoscopic Top repair	04/10/2014	100/70	11.2
Kandhan	45	68650	RIH	Laparoscopic Top repair	01/10/2014	120/70	15.6
Nandagopal	67	68642	Lymphangitis L leg	Conservative	06/10/2014	120/80	13.8
Pichaimuthu	25	68668	Acute pancreatitis	Conservative	04/10/2014	170/10	
Kathiravan	26	69077	Appendicular mass	conservative	07/10/2014	130/70	13.4
Bairaman	48	68655	DM L foot	Dressing	09/10/2014	130/80	13.2
Jayaraman	35	69114	Acute pancreatitis	conservative	10/10/2014	120/80	
Neelraj	14	69295	Epigastric hernia	Hernia repair	11/10/2014	120/80	12.4
Nichan raja	38	69253	L submandibular sialadenitis	Sialadenectomy	15/10/2014	120/80	
Kuzhandavel	20	69233	LIH	lap/ open hernia repair	15/10/2014	110/80	16.6
Thomas	30	69240	LIH	open hernia repair	15/10/2014	120/80	10.0
Jayaraman	55	69688	raw area Rt ankle	SSG	21/10/2014	120/70	13.1
Sundaramoorthy	66	69681	CA stomach	UGIE JIPMER referral	21/10/2014	120/80	13.7
Ezhumalai	62	69684	ROIH	Meatoplasty	23/10/2014	140/80	11.2
Jayaram	55	70268	Raw area R ankle	SSG	01/11/2014	120/80	13.7
Murugesan	32	70353	LIH	hernia repair	07/11/2014	110/80	13.9
Rayar	65	70356	RIH	Meatoplasty	07/11/2014	110/80	12.6
Saravanan	14	70612	Subacute appendicitis	Lap appendectomy	11/11/2014	110/70	13.0
Jayaram	34	70600	LIH	hernia repair	11/11/2014	120/80	16.8
Ezhumalai	26	70732	LIH	Lap TEPP	11/11/2014	120/80	14.6

Figure 5: Picture showing the master list of all the patients admitted to the unit serving as a archive (names changed).

The master patient list

All the patients who are discharged from the unit are placed in another sheet labeled the master list by simply cutting and pasting the patient's row from the active list to this sheet (Figure 5). This sheet will serve as a database

of all the patients treated by the unit and can be used for various research purposes and for planning the working of the unit. We can get various statistics like the number of patients admitted, operated and identify lean and busy months etc.

The screen shot

A screen shot of any of the sheets can be taken and can be sent to all the members of the team or to the relevant personnel by using popular mobile applications like the Whatsapp, Viber etc.

For example the screen shot of the operation theatre list can be sent to the anesthetist, a screen shot of the operation notes to the pathologist and the discharge summary to the referring physician.

RESULTS

All the patients who were admitted to our unit were managed using this system from January 2012 till January 2016.

A total of 30 residents and interns who worked in the unit during the study period answered the questionnaire.

Table 1: Scores for signifying the ease of use various parameters.

Parameter	Average score at 2 weeks	Average score at 4 weeks
Ease of use of the software	5	7
Managing the patient list	5	8
Preparation of OT list	7	9
Preparation of OT notes	5	8
Preparation of discharge summary	4	6

* Score of 1 denotes very difficult and a score of 10 represents very easy.

All the members of the team adapted favorably to this system (Table 1). The average scores for all the parameters improved over the period of 2 weeks.

Table 2: Average time taken for completing a task.

Parameter	Average time taken in minutes
Preparation of OT list	3
Preparation of OT Notes	7
Preparation of discharge summary	12

The average time taken was the least for preparing the OT list and preparing the discharge summary took the

most time (Table 2). The data used and the average cost for each of these activities are listed in Table 3.

Table 3: Average data used and cost involved in completing a task.

Parameter	Data usage	Cost in India in rupees
Managing the ward	1.49 MB	0.39
Preparation of OT list	0.98 MB	0.25
Preparation of OT Notes	0.64 MB	0.16
Preparation of Discharge Summary	1.96 MB	0.51

DISCUSSION

There are a plenty of patient management softwares available for the purpose of use in patient care but all of them are expensive to buy and to maintain. Many of these software's are not available on all the devices and will require a computer and are cumbersome to use. The google drive on the other hand is available free of cost, free to maintain, available on all the devices like a computer or a mobile phone. It can be customised as per the requirement of the unit to serve various purposes like patient management, research and teaching. One of the downsides of this software is that it has to be customised by the team for the initial setup.⁶

The adaptation of this system may face an initial resistance from the members of the team since it involves learning of new things and they can find keying in of the data, as this system of electronic record keeping has to be supported and enforced by the unit leadership. Like all new systems when this system is kept enforced this team will begin to reap the benefits. During our literature search we did not come across any report of google drive being used as a patient management software.⁷

CONCLUSION

It is feasible to use google drive as a patient management system by a surgical unit to organize work. This system is efficient, secure and cost effective.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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