

A STUDY ON VENOUS THROMBOEMBOLISM PROPHYLAXIS COMPLIANCE AND CHALLENGES

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Introduction

- ▶ Venous thrombo-embolism (VTE) is a potentially preventable complication in every hospitalized patient. The spectrum varies from asymptomatic DVT (deep vein thrombosis) to sudden unexplained death due to Pulmonary Embolism (PE).
- ▶ Long-term sequelae include chronically swollen leg and venous ulcers which are difficult to manage, and entail considerable costs to the patient as well as the society. Timely risk assessment and appropriate use of prophylaxis to prevent VTE in those at risk is a critical safety practice in Max healthcare.
- ▶ VTE may contribute to up to 12% of deaths in ICU and is the No.1 preventable cause of hospital death. Silent DVT is present in 5-10% of ICU patients despite thrombo-prophylaxis.
- ▶ ICU doctors often have a skewed perception of the risk of bleeding in ICU patients, predisposing them to avoiding anticoagulation. So, there is a need to create awareness amongst the concerned authorities to put light on the issue and to work in the direction of reducing the incidence by providing the required prophylaxis.

Aim:

To improve health care professionals' compliance with evidence-based guidelines for VTE prevention in hospitalized patients.

Objective(s):

- To investigate the compliance of patient assessment for venous thromboembolism within 48 hours of admission in the hospital.
- To measure the compliance of initiating the prophylactic measures according to the VTE status of the patients.
- To test whether certain targeted intervention will reduce non compliance or not.



HYPOTHESIS:

Ho: There is no significant effect in the VTE non compliance status after the intervention.

H1: There is significant effect in the VTE non compliance status after the intervention.

RESEARCH QUESTIONS

- How much is the compliance in provision of Venous Thromboembolism prophylaxis in inpatients of Max Super specialty, Dehradun.
- What are the challenges faced?

IMPORTANCE OF VTE PROPHYLAXIS

- Appropriate use of prophylaxis against deep vein thrombosis (DVT) in hospital inpatients is important for reducing the risk of fatal and non-fatal pulmonary embolism and post-thrombotic complications.



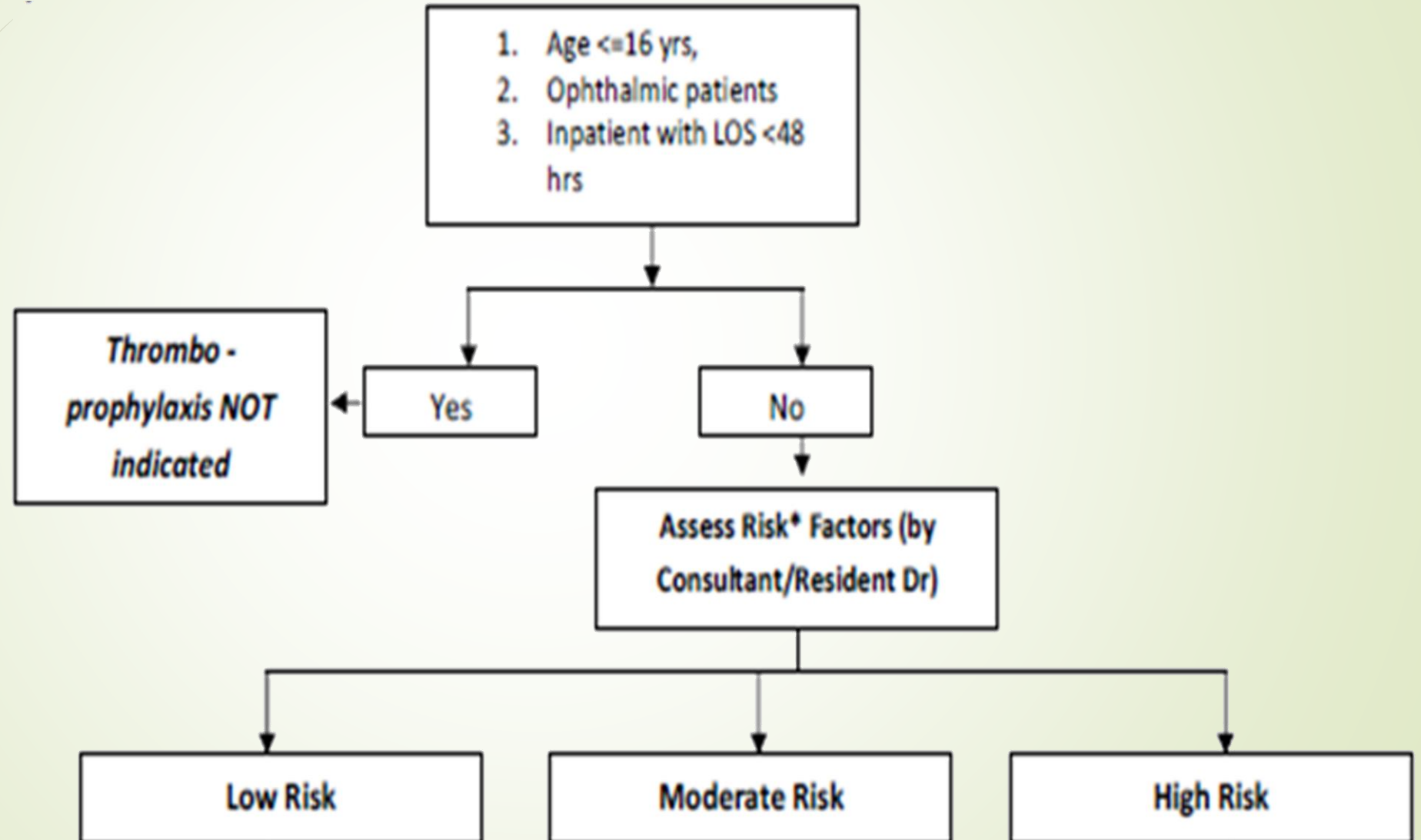
Why hospital wants to prevent VTE?

- It is estimated that one in 100 patients admitted to a hospital dies because of PE.
- It appears possible than more than one-half of these at-risk patients could be saved if effective prophylaxis was used. "Pulmonary embolism remains the most common preventable cause of death in hospital".

To provide prophylaxis for VTE, it is important to understand and being aware of the risk factors for VTE, which are as follows:

- Major general surgeries
- Major orthopedic surgeries
- Injuries of spinal cord
- Pelvis, hip, or long bones' fracture
- Multiple trauma
- Malignancy
- Myocardial infarction
- Congestive heart or respiratory failure
- Prior VTE
- Age
- Usually above 40 years of age
- Rare in children
- Obesity
- Immobility
- Varicose veins
- Pregnancy and the Puerperium
- Oral contraceptives
- Antiphospholipid antibody syndrome
- Hereditary risk factors
- Antithrombin deficiency
- Protein C and Protein S deficiencies
- Coagulation factors
- Hyperhomocysteinemia

The recommended prophylaxis policy for VTE at Max superspeciality hospital is given below:



Low Risk

- Ambulatory patient without additional VTE risk factors
- Expected length of stay <2 days
- Minor surgery in patients without additional VTE risk factors (same day surgery or operating room time <30 minutes)

Early Ambulation

Moderate Risk

Patients who aren't in either the low or high risk groups

CHOOSE ONE OPTION

- Inj Enoxaparin 40 mg SC q 24 hrs, **OR**
- Sequential Compression Device (SCD)
 - Both lower extremities
 - Right leg only
 - Left leg only
 - Patient intolerant or has skin lesions on both legs (do not use SCD)
 - (ref contraindications)

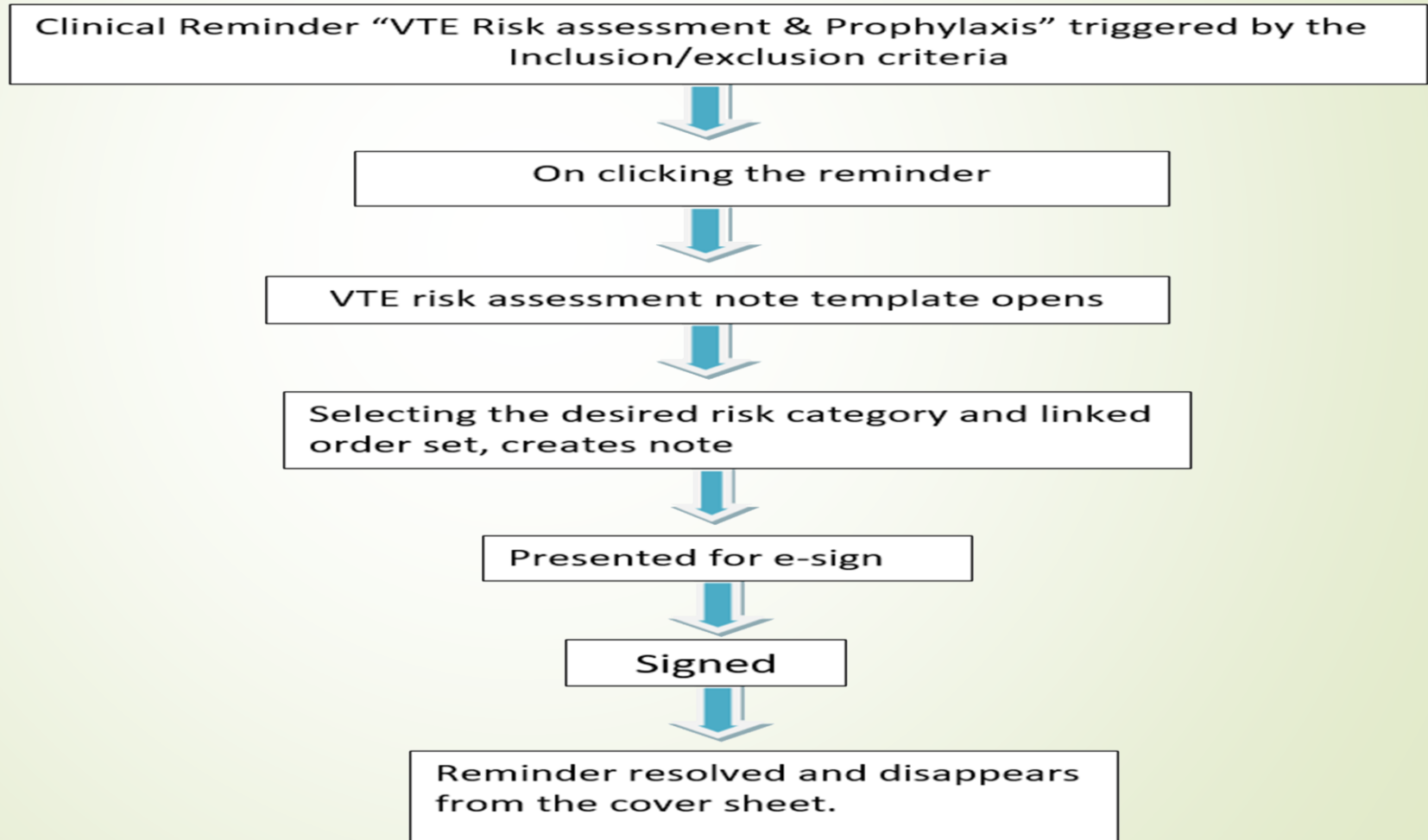
High Risk

- Elective hip/knee arthroplasty
- Acute Spinal cord injury with paresis
- Multiple major trauma
- Abdominal or Pelvic surgery for cancer
- Intensive Care Unit patient

CHOOSE BOTH THE TREATMENT OPTIONS (unless contraindicated for heparin)

- Inj Enoxaparin 40 mg SC q 24 hrs
- Sequential Compression Device (SCD)
 - Both lower extremities
 - Right leg only
 - Left leg only
 - Patient intolerant or has skin lesions on both legs (do not use SCD)
 - (ref contraindications)

Workflow in Computerized Patient Record System



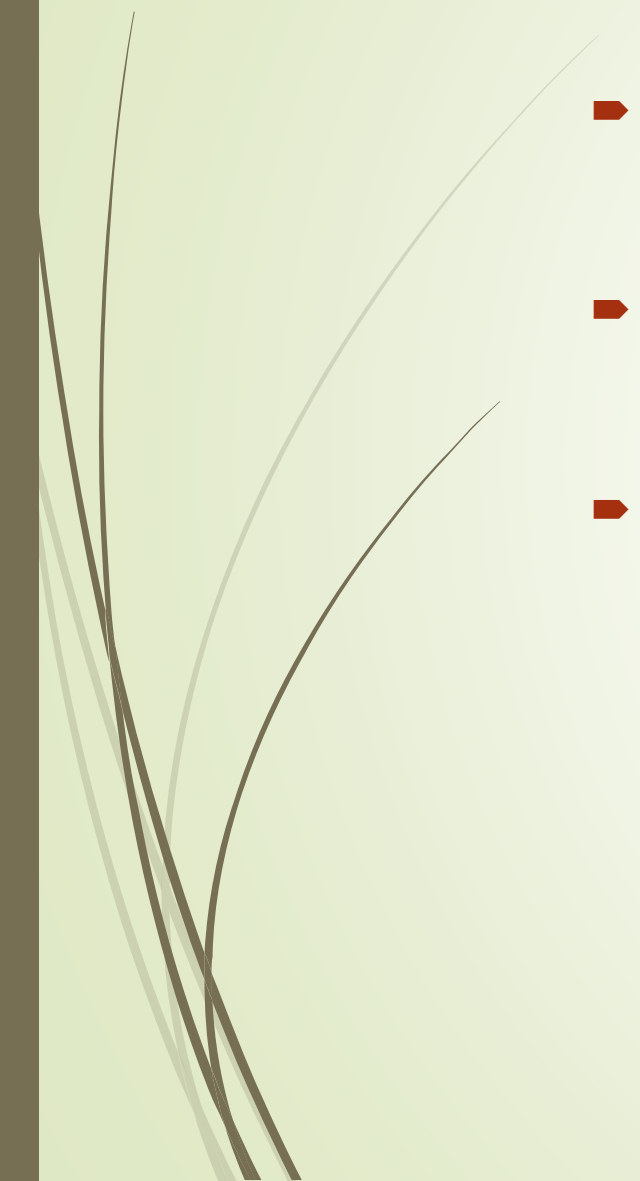


METHODOLOGY

- **Sample size** : The sample size for the study is 726 inpatients.
- **Sampling**: Purposive sampling
- **Study Design**: Observational study
- **Sampling criteria/Selection** : Patients who had completed 48 hours from the time of admission in the hospital from Feb 2018 – April 2018.
- **Sample Population**: Inpatient of 5 departments admitted in Max Super speciality Hospital, Dehradun (Cardiology, Neurology, Orthopedics, General Surgery and Obs & Gynae)
- **Data collection**: The data is collected through CPRS software used in the hospital
- **Data analysis**: Descriptive analysis was done under MS Excel to assess which intervention made a difference in compliance and results will be presented in the form of different charts.
- **Study duration**: Three months (Feb 2018- April 2018)



Process Flow:

- The patients who had been assessed for the initial assessment and had completed 48 hours from the time of admission in the hospital, were selected and their VTE risk assessment form were checked in CPRS.
 - The VTE risk assessment form was checked against some parameters. Reminders were sent to the consultants if the status is pending via calls , Messages and popup on the cover sheet of CPRS.
 - The data (Resolved and Pending) was then compiled and analyzed according to the different parameters and areas through Bar graphs and Pareto Analysis.
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Results and Interpretation

Rate of compliance to VTE Risk documentation

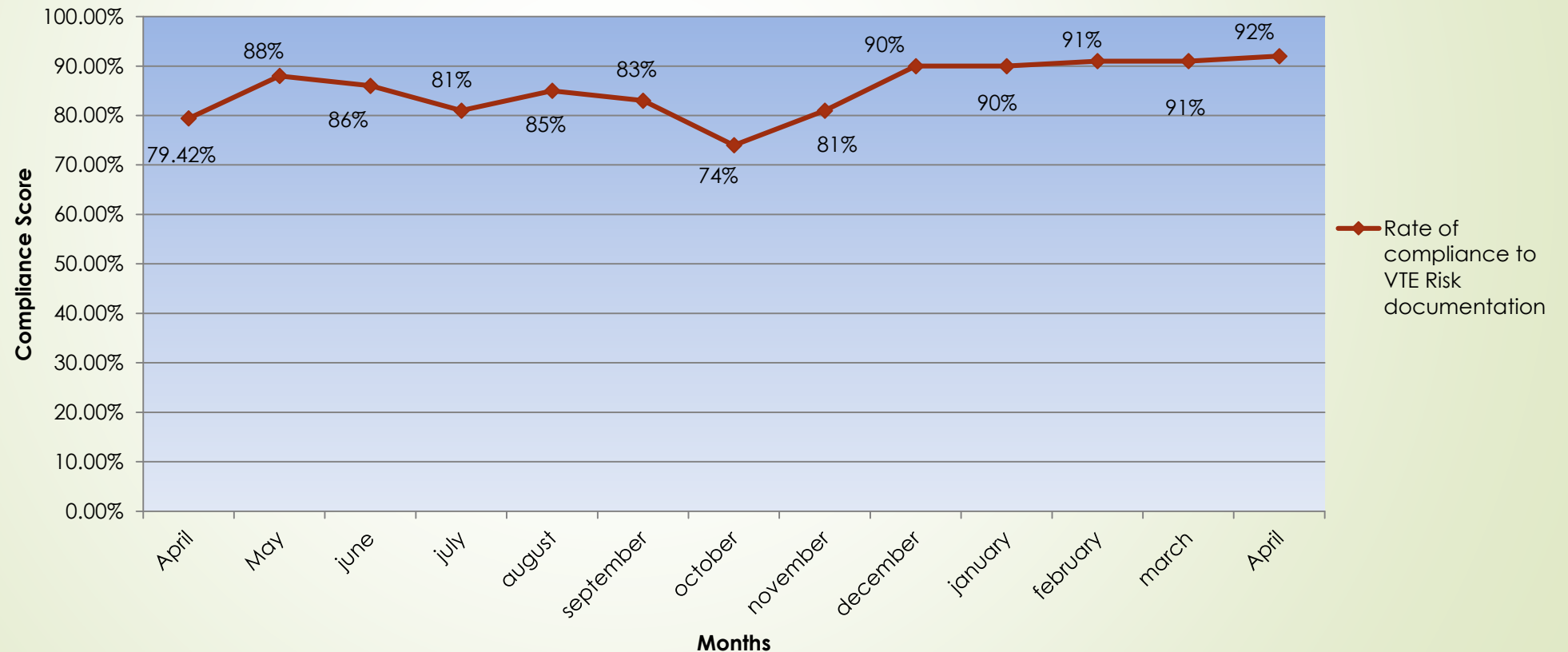
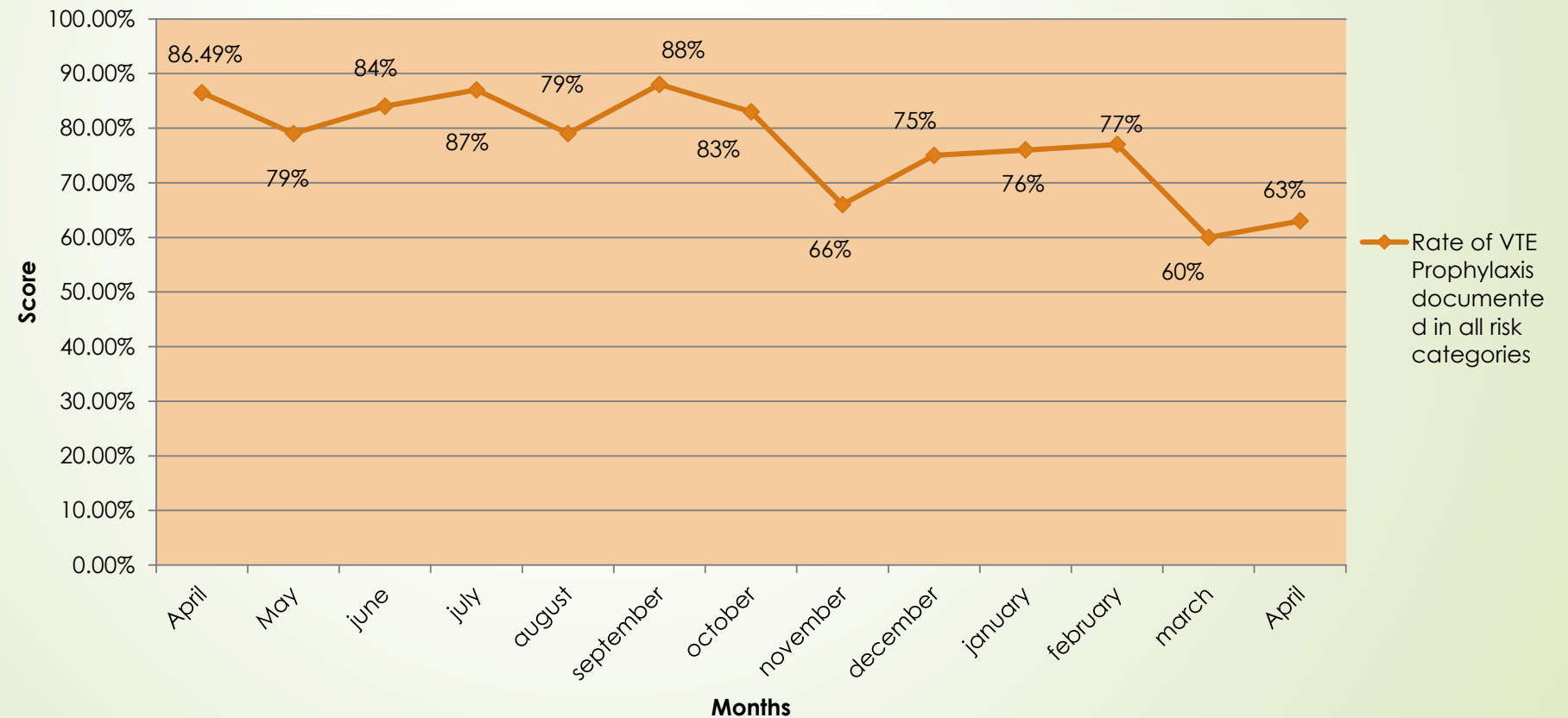


Fig 1: Rate of compliance to VTE Risk documentation

Results and Interpretation

Fig 2: Rate of VTE Prophylaxis documented in all risk categories



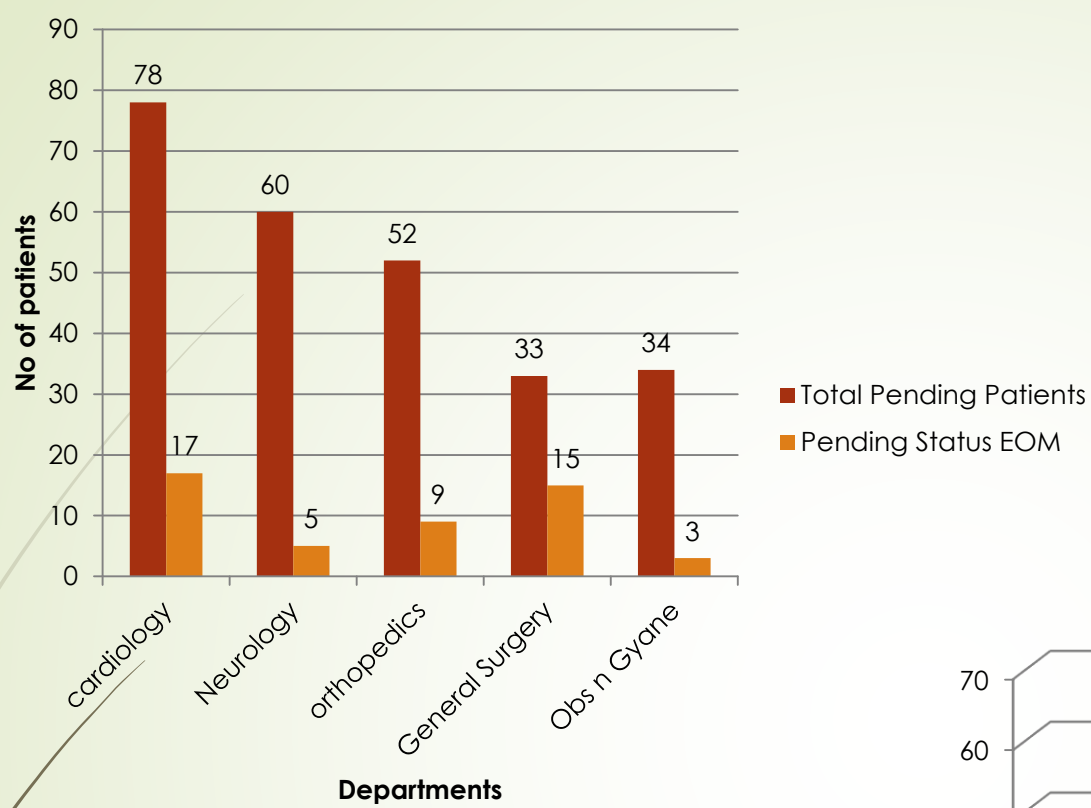


Fig 3: Graphical representation of total number of Non compliances vs total number of pending non compliance end of the month. (Feb 2018)

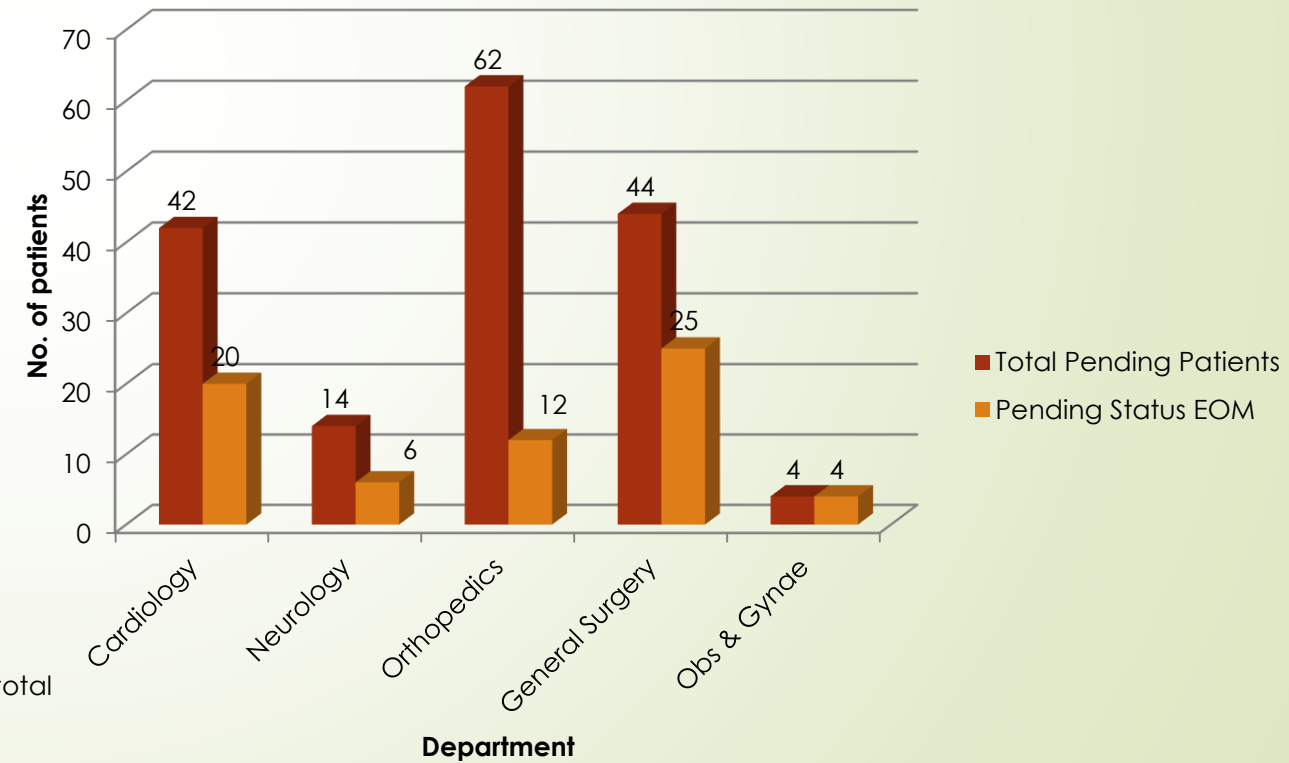


Fig 4: Graphical representation of total number of Non compliances vs total number of pending non compliance end of the month. (March 2018)

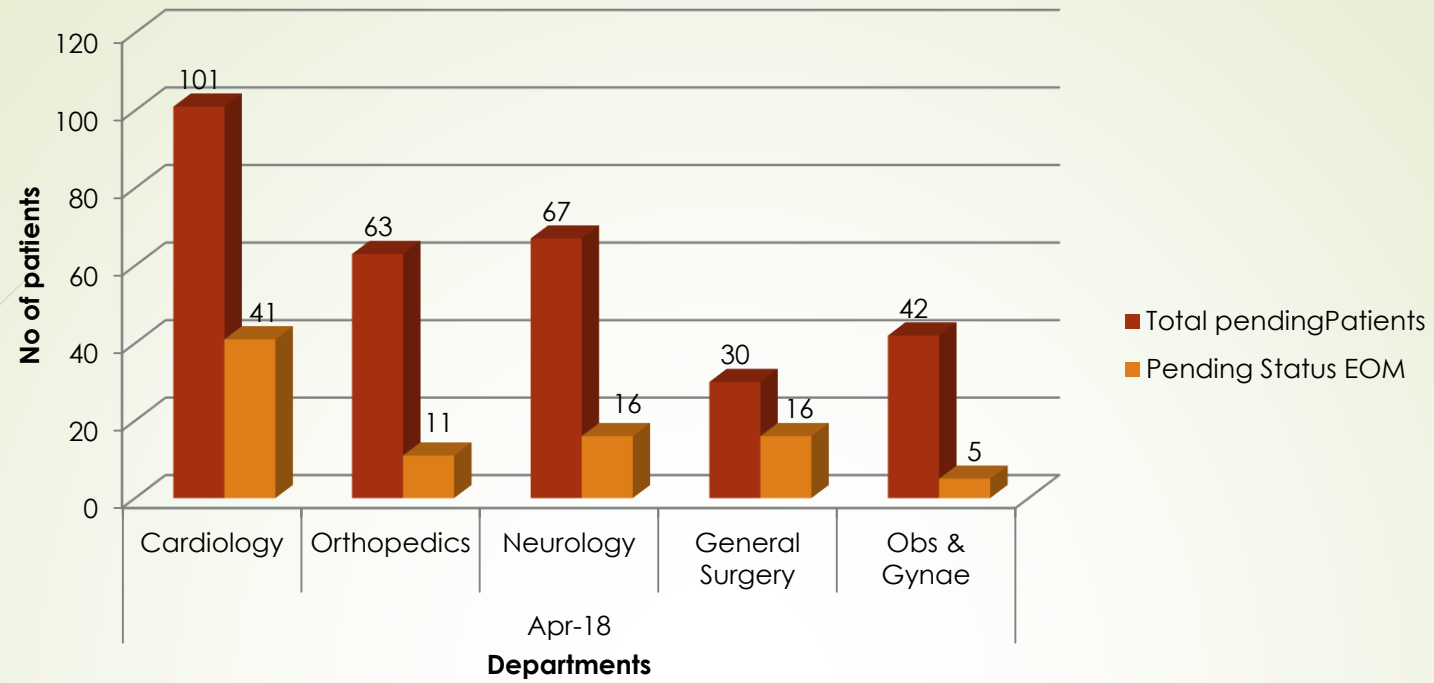
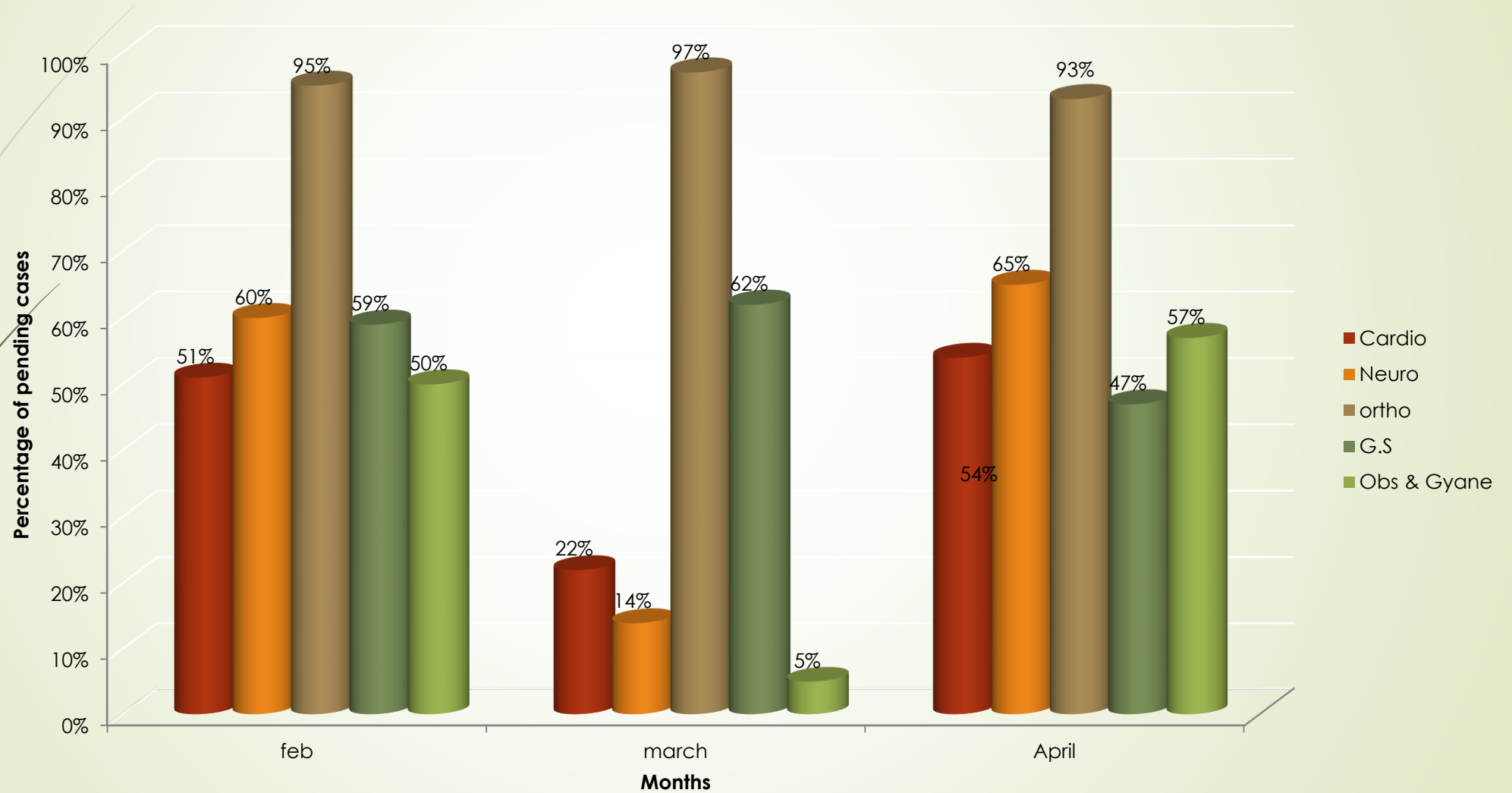


Fig 5: Graphical representation of total number of Non compliances vs total number of pending non compliance end of the month. (April 2018)

Fig 6: Pending Non Compliance for three months



Root cause analysis : Fig 7

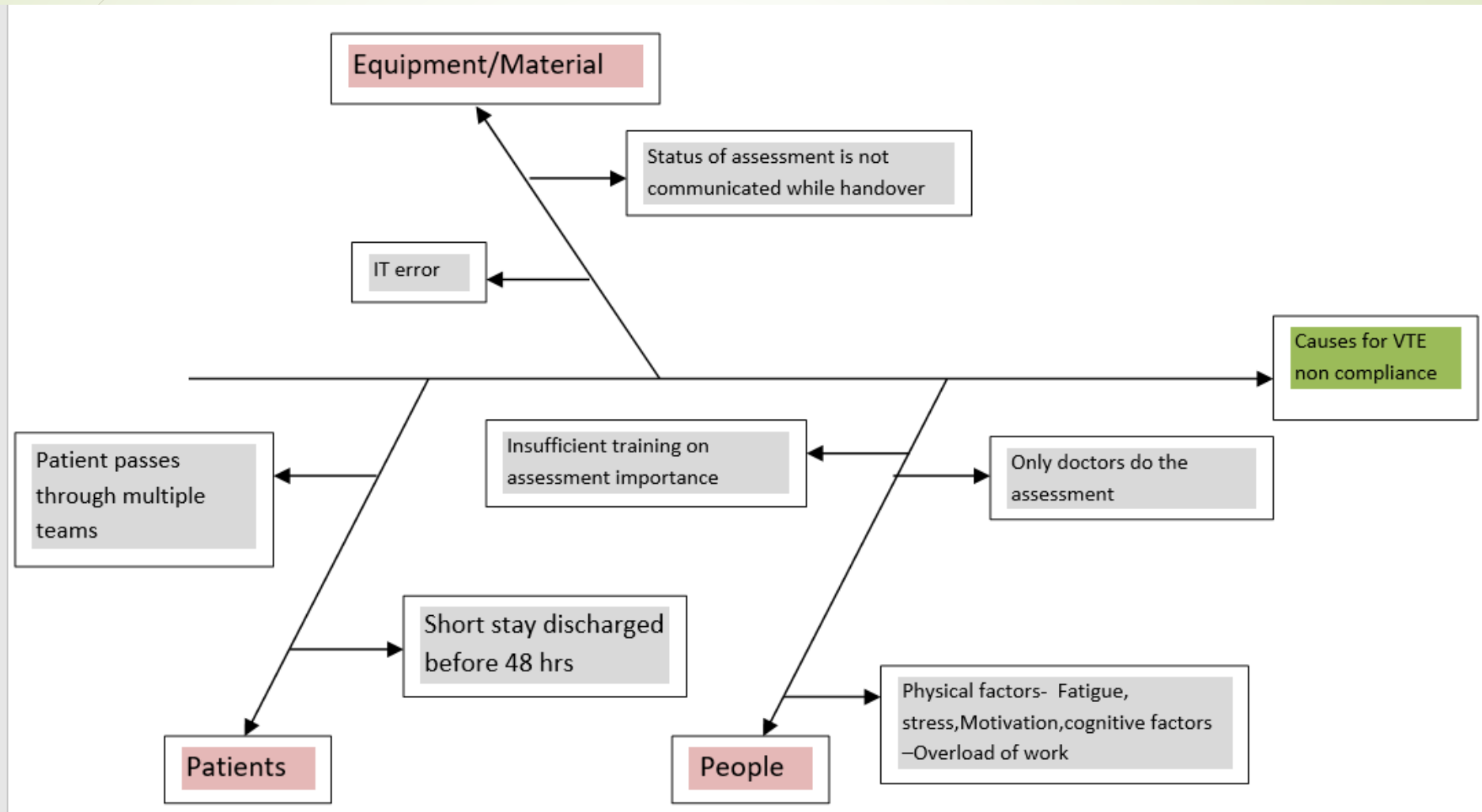


Fig 8: Inferential analysis of effect of intervention on total pending case in 3 months

The null hypothesis is

- Ho: There is no significant effect in the VTE non compliance status after the intervention. ($P_1 = P_2$)
- H1: There is significant effect in the VTE non compliance status after the intervention ($P_1 \neq P_2$)

P_1 & P_2 = TOTAL NUMBER OF NON COMPLIANCE CASES AT TWO CONSEQUETIVE TIME POINTS

N_1 & N_2 = TOTAL NUMBER OF CASES AT TWO CONSEQUETIVE MONTHS

- The computed Z falls in the area of rejection if beyond ± 1.96 .

The data was collected at 3 time points viz at the end of month of Feb, end of March and end of April each month the non compliance cases of previous months were regularly followed up through following interventions.

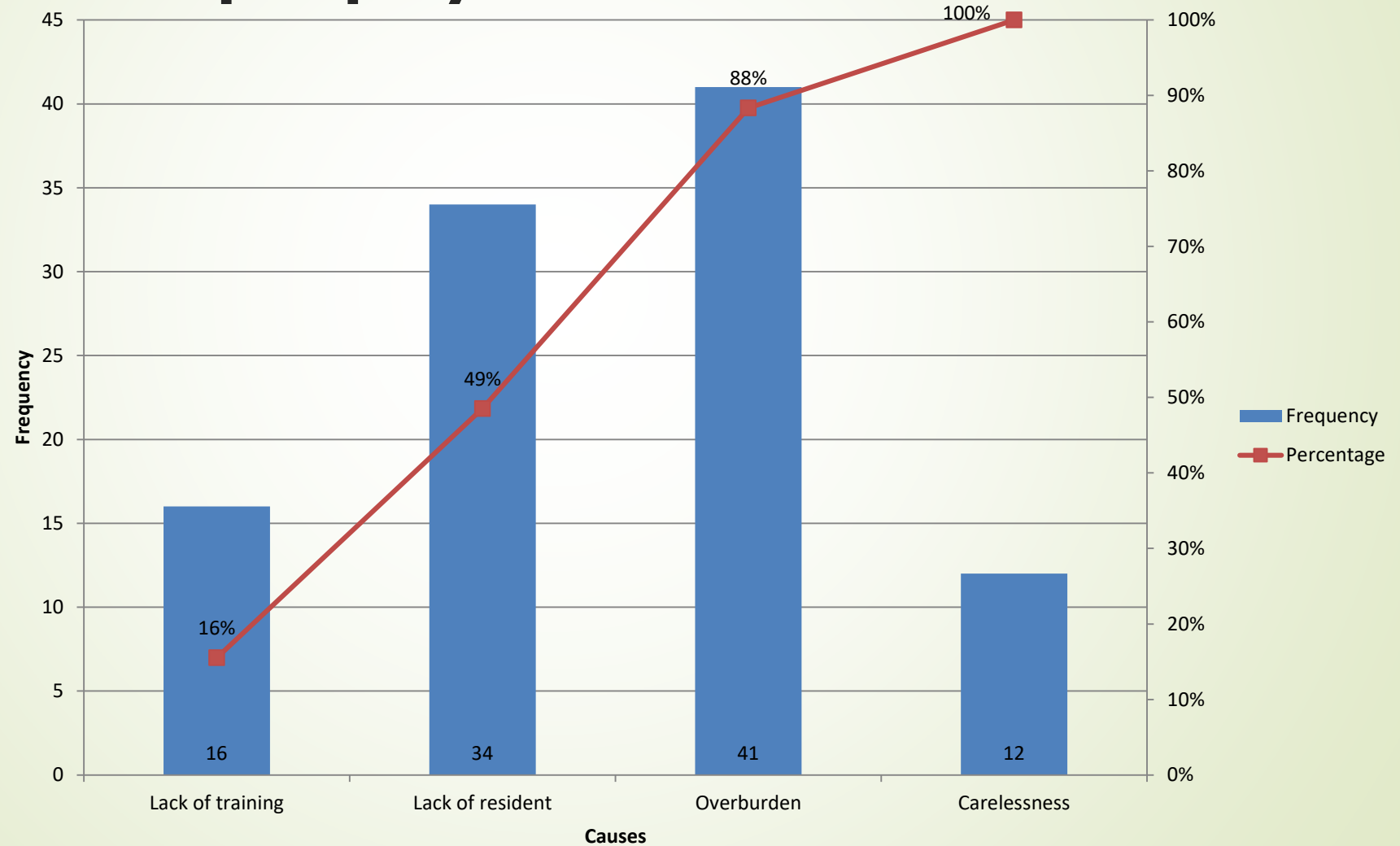
- Regular reminders through calls and messages
- Daily auditing is done
- CPRS training given to the new joining doctors
- Regular internal meetings conducted

Fig:8 Z test

		p1	n1	p2	n2	$(n1*p1) + (n2*p2)$	p0	q0	$p0*q0$	$(n1+n2)/(n1*n2)$	sp1-p2	Z	Results
Feb - March	Cardiology	0.5098	153	0.22	191	120	0.349	0.651	0.227	0.012	0.108	2.672	Accepted
	Neurology	0.6	100	0.14	100	74	0.37	0.63	0.233	0.02	0.141	3.2527	Accepted
	Orthopaedics	0.9455	55	0.969	64	114	0.958	0.042	0.04	0.034	0.184	-0.127	Rejected
	General Surgery	0.5893	56	0.62	71	77	0.606	0.394	0.239	0.032	0.179	-0.17	Rejected
	Obs and Gynae	0.5	68	0.049	81	38	0.255	0.745	0.19	0.027	0.164	2.7398	Accepted
March - April	Cardiology	0.2199	191	0.54	187	143	0.378	0.622	0.235	0.011	0.103	-3.113	Rejected
	Neurology	0.14	100	0.65	103	81	0.399	0.601	0.24	0.02	0.14	-3.636	Rejected
	Orthopaedics	0.9688	64	0.926	68	125	0.947	0.053	0.05	0.03	0.174	0.2428	Accepted
	General Surgery	0.6197	71	0.469	64	74	0.548	0.452	0.248	0.03	0.172	0.8759	Accepted
	Obs and Gynae	0.0494	81	0.568	74	46	0.297	0.703	0.209	0.026	0.161	-3.222	Rejected

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- From **February to March** it was observed that because of regular follow ups in Cardio, Neurology, & Obs & Gynae registered statistically significant reduction in non compliance.
 - Orthopedics & General surgery registered non significant reduction in non compliance. This was because of the following reasons
 - -Absence of two doctors at the same time for a long duration.
 - -Doctors coordinator left the job
 - Thus regular follow up was increased in orthopedics and general surgery in next month and in other three departments the concentration of follow-up was diluted.
 - From March to April increase in compliance was seen in Orthopedics and General Surgery although it was not statistically significant.
 - It was a worrisome finding that in the departments where improvement was seen after first intervention, there was again a reversal of pendencies which was statistically significant thus indicating that regular follow up has to be continuously done and any dilutions in the same would be detrimental to compliances.

Fig 9: The reasons for non-compliance of VTE prophylaxis





To overcome these gaps the following measures are taken by Max super specialty hospital, Dehradun:

- Daily auditing is done to track the compliance
- Regular CPRS training is given to all the Doctors (Old and the new joining)
- Regular internal committee meeting is conducted
- Reminders are given to them via calls, messages, popup
- Legal importance is shared to the staff.



RECOMMENDATION:

- Appreciation (Reward system) should be given to the department who maintains the highest compliance.
- Motivation of the staff should be done regularly and the importance of VTE prophylaxis should be discussed with them via Flipcharts and videos.
- Involve residents to help in the VTE documentation.
- Nursing specialist to motivate to inform the doctors if they are occupied with work.
- Take strict actions on certain departments by Medical services.
- Crisis Management Event should be conducted on VTE.
- Start targeting discharge patients



Conclusion:

- An observational study on “Venous Thromboembolism prophylaxis compliance and the challenges faced” was conducted in Max Superseniority hospital, Dehradun from Feb 12th, 2018 to May 10th, 2018, to check if the patients are being assessed for VTE risk assessment within 48 hours of admission in the hospital and to measure the compliance of initiating the prophylactic measures for VTE to the patients according to their VTE status.
- The study could find that 91 % (Target 100%) patients admitted are being assessed for the risk of VTE , within 48 hours of admission in the hospital and 64% (Target is 95%) of the patients are being assessed for the prophylactic measures which should be provided to the patients according to the risk status for VTE. These two are the major findings in the study. The reasons for the gaps are Overburden of work, Lack of staff, lack of training is seen because the attrition rate is high. It was a worrisome finding that in the departments where improvement was seen there was again a reversal of pendencies which was statistically significant thus indicates that regular follow up has to be continuously done and any dilutions in the same would be detrimental to compliances.

File Edit View Tools Help				
SINGH,NEGI		DN-SICU DN-CCU-03	Primary Care Team Unassigned	No Diagnosis Found
180	May 11, 11	Provider: GEORGE,ANKITA	Attending: Sharma,Preeti	Flag Remote Data No Postings
Active Problems		Allergies / Adverse Reactions		Postings
Atypical Chest Pain Coronary Artery Dissection Urethral Stricture, Unspecified		No Known Allergies		No Patient Postings Found
Active Medications		Clinical Reminders	Due Date	
Cremafin Plus 170ml Btl Syrup		VTE Risk Assessment & Prophylaxis	DUE NOW	
Silofast D 8mg Cap,Oral		Mortality Risk Score	DUE NOW	
Ecosprin Av 150 Cap,Oral				
Furosemide 10mg/MI 2ml Ud Amp Inj,Soln				
Enure Plus Vanilla 1kg Powder				
Digene Mix Fruit 170ml Btl Syrup				
Domperidone Ud 10mg Tab				
Spirinolactone Ud 25mg Tab				
Levosulbutamol Ud 0.31mg/2.5ml Respule				
Febuxostat Ud 40mg Tab				
Celurosome 1.5gm Ud Vial Inj				
Pantoprazole Inj,Pwdt				
Budesonide 1mg/MI 2ml Ud Amp Inj				
Ranolazine Ud 500mg Tab				
Glycerol Trinitrate Ud 2.5mg Tab				
Cevexidol Ud 3.125mg Tab				
Sodium Ficosulphate Ud 10mg Tab				
Proctolyses Btl Enema				
Domperidone Ud 10mg Tab				

File Edit View Action Options Tools Help				
URANA		DN-SICU DN-CCU-01	Primary Care Team Unassigned	No Diagnosis Found
180	Jan 01, 18	Provider: GEORGE,ANKITA	Attending: Sharma,Preeti	Flag Remote Data No Postings
Last 100 Signed Notes		Adm: 04/05/18 VTE RISK ASSESSMENT AND PROPHYLAXIS, DDN-1STFLR-CCU, Pankaj Kumar PANDEY (May 06, 19)		
All signed notes		LOCAL TITLE: VTE RISK ASSESSMENT AND PROPHYLAXIS STANDARD TITLE: LONG TERM CARE RISK ASSESSMENT SCREENING NOTE DATE OF NOTE: MAY 06, 2018@21:36 ENTRY DATE: MAY 06, 2018@21:36:43 AUTHOR: PANDEY, PANKAJ KUMAR EXP COSIGNER: URGENCY: STATUS: COMPLETED VTE RISK ASSESSMENT AND PROPHYLAXIS Name: KHURANA, G P SSN: 180-19-2088 Sex: MALE Age: 79 Ward: DDN-1STFLR-CCU Moderate Risk: Pharmacologic Anticoagulant Therapy /es/ Pankaj Kumar PANDEY Senior Resident Signed: 06/05/2018 21:37		
May 07, 18 PROGRESS NOTE - CLINICAL CARDIOLOGY, DDN-1STFLR-CCU, HARSH DEEP SINGHAL				
May 07, 18 NURSING - CRITICAL CARE MONITORING SHEET, DDN-1STFLR-CCU, TENZIN YANGZOM				
May 06, 18 IP CLINICAL CARDIOLOGY ASSESSMENT, DDN-1STFLR-CCU, Pankaj Kumar PANDEY				
May 06, 18 VTE RISK ASSESSMENT AND PROPHYLAXIS, DDN-1STFLR-CCU, Pankaj Kumar PANDEY				
May 06, 18 NURSING - CRITICAL CARE MONITORING SHEET, DDN-1STFLR-CCU, Ankita Kumar DAL				
May 06, 18 DIETETIC NOTE, DDN-1STFLR-CCU, DOLLY BALIYAN				
May 06, 18 IP NEPHROLOGY ASSESSMENT, DDN-1STFLR-CCU, PUNEET ARORA				
May 06, 18 PROGRESS NOTE - CLINICAL CARDIOLOGY, DDN-1STFLR-CCU, HARSH DEEP SINGHAL				
May 06, 18 PROGRESS NOTE - CLINICAL CARDIOLOGY, DDN-1STFLR-CCU, Ashok KUMAR				
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May 05, 18 NURSING - CRITICAL CARE MONITORING SHEET, DDN-1STFLR-CCU, Ankita Kumar DAL				
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May 05, 18 DIETETIC NOTE, DDN-1STFLR-CCU, DOLLY BALIYAN				
May 05, 18 NURSING - CRITICAL CARE MONITORING SHEET, DDN-1STFLR-CCU, PEMA CHODON				
May 05, 18 PROGRESS NOTE - CLINICAL CARDIOLOGY, DDN-1STFLR-CCU, Ashok KUMAR				
May 05, 18 NURSING - CRITICAL CARE MONITORING SHEET, DDN-1STFLR-CCU, Manika NAUTYAL				
May 04, 18 NURSING ADULT IP ASSESSMENT, DDN-1STFLR-CCU, TENZIN YANGZOM				
May 04, 18 PROGRESS NOTE - CLINICAL CARDIOLOGY, DDN-EMERGENCY, SUKHWINDER SINGH				

Annexure

☐ Low Risk:

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Ambulatory patient without additional VTE risk factors or expected length of stay <2 days.

Minor surgery in patients without additional VTE risk factor (same day surgery or operating room time <90 minutes).

☐ Early ambulation

☐ Moderate Risk:

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Patients who aren't in either the low or high risk groups.

Linked Order Sets for selection:

(Choose one of the treatment options)

☐ Pharmacologic Prophylaxis

☐ Sequential Compression Therapy

☐ Patient already on VTE Prophylaxis.

☐ High Risk:

=====

Elective hip or knee arthroplasty.

Acute Spinal cord injury with paresis.

Multiple major trauma.

Abdominal or Pelvic surgery for cancer.

Action:

☐ Patient already on VTE Prophylaxis.

☐ Linked Order Sets for selection:

(Choose both the treatment options, unless contraindicated for heparin)

☐ Pharmacologic Prophylaxis

☐ Sequential Compression Therapy



Thank
you!!