Study on Venous Thromboembolism Prophylaxis Compliance and Challenges

By

Ankita George

Dissertation submitted for the partial fulfillment of the

MBA Hospital and Health Management

Academic year, 2016-2018

The IIHMR University, Jaipur

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INSTITUTE OF HEALTH
MANAGEMENT RESEARCH
(WHO Collaborating Centre for District Health System Based on Primary Health Care)

IIHMR UNIVERSITY

TO WHOMSOEVER MAY CONCERN

This is to certify that **Dr. Ankita George** student of MBA Hospital and Health Management, The IIHMR University, Jaipur has undergone internship training at **Max Super Speciality Hospital, Dehradun** from 12th **February 2018 to 10th May 2018.**

The Candidate has successfully carried out the study designated to her during internship training and her approach to the study has been sincere, scientific and analytical.

The Internship is in fulfilment of the course requirements.

I wish her all success in all his future endeavours.

Dr. Ashok Koushik
Dean, Academics and Student Affairs
The IIHMR University, Jaipur

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MAX HEALTHCARE

The certificate is awarded to

Dr. ANKITA GEORGE

in recognition of having successfully completed her

Dissertation in the department of

MEDICAL SERVICES

and has successfully completed her Project on

A STUDY ON VENOUS THROMBOEMBOLISM PROPHYLAXIS COMPLIANCE AND IT'S CHALLENGES

From 12th February to 10th May, 2018

At

Max Super Specialty Hospital, Dehradun

She comes across as a committed, sincere & diligent person who has a strong drive and zeal for learning

We wish her all the best for future endeavors.

Rahul Prashad

Medical Superintendent

Dr. (Maj.) Rahul Prashad
Medical Superintendent
Max Super Speciality Hospital, Dehradun

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CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled **A study on Venous thromboembolism prophylaxis compliance and challenges** and submitted by **Dr. Ankita George** Enrolment No. **MBA-HM-0386** under the supervision of **Dr. Tanjul Saxena** for award of MBA in Hospital and Health of the University carried out during the period from **12th February 2018 to 10th May 2018** embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other institute or other similar institution of higher learning.

Signature

(Dr. Ankita George)

ACKNOWLEDGEMENT

I would take the opportunity to acknowledge the people without whom this project wouldn't have seen the light of the day. In our efforts towards the realization of the project work, I have drawn on the guidance of many people who facilitated in shaping and remodeling the project.

I got the opportunity to pursue my dissertation from Max Super specialty hospital, Dehradun , which is one of the best healthcare service providers.

I would like to thank my mentors and guide **Dr (Maj) Rahul Prashad** (MS, Max Super specialty hospital, Dehradun) and **Dr Tanjul Saxena** (IIHMR University, Jaipur) to help me and giving me necessary advices and guidance.

I would also like to share my deepest sense of gratitude to **Mr Ashok Chhatri** (DM-Medical Quality), **Dr Subin Mathew** (AMS) for their support and guidance throughout my training period.

I embrace upon this as an opportunity for my following career. I will try to use the skills and knowledge gained in the best possible way.

Sincerely,
Dr Ankita George
IIHMR University, Jaipur

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Title: **A STUDY ON VENOUS THROMBOEMBOLISM PROPHYLAXIS COMPLIANCE AND IT'S CHALLENGES**

INTRODUCTION:

BACKGROUND

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.

- Venous Thromboembolism is no longer a rarity in India. Until the 1990s, venous thromboembolism (VTE) was viewed primarily as a complication of hospitalization for major surgery (or associated with the late stage of terminal illness). However, recent trials in patients hospitalized with a wide variety of acute medical illness have demonstrated a risk of VTE in medical patients comparable with that seen after major general surgery. Mortality and morbidity from VTE is a significant problem in India. It is one of the commonest causes of unplanned readmission and preventable death. General surgical operations are the most common causes of post-operative DVT. Pulmonary embolism continues to be suspected more than it is diagnosed.

- 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.

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.

Recognized risk factors for DVT are generally related to one or more elements of Virchow's triad(stasis, vessel injury, and hypercoagulability) and include surgery, trauma , immobilization, malignancy, use of estrogens, heart or respiratory failure, and smoking. Surveillance studies have found that the absolute risk of DVT is 10%-20% among general medical patients and up to 40%-80% in patients having hip surgery, knee surgery, or major trauma.

Why Hospitals 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".

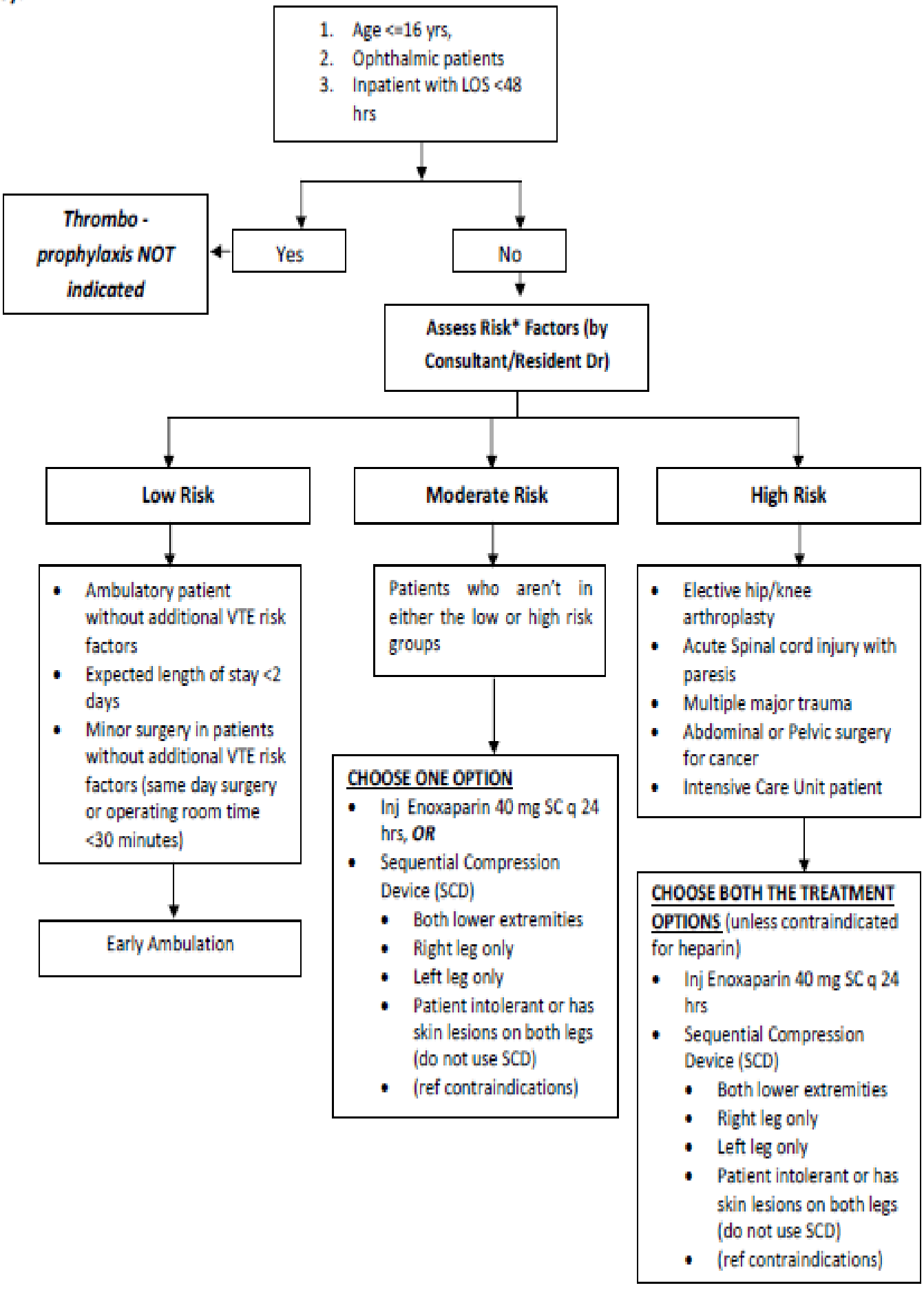
To provide prophylaxis for VTE, it is important to understand and being aware of the risk factors for VTE, which are as follows:

- 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

These risk factors require prophylaxis measures to decrease the incidence of the VTE amongst the patients. The recommended prophylaxis for VTE is given below:

Policy:


1. Age <=16 yrs,
2. Ophthalmic patients
3. Inpatient with LOS <48 hrs
Thrombo - prophylaxis NOT indicated
Yes
No
Assess Risk* Factors (by Consultant/Resident Dr)
Low Risk
Moderate Risk
High 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
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)
• 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)

At Max hospital, Dehradun How VTE is tracked??

When a patient is admitted in the hospital, he/she is to be assessed within one hour and half an hour as the initial assessment by the doctor and the nurse respectively and has to be assessed for VTE risk within 48 hours of admission. Then, the above recommended prophylaxis according to the VTE status of the patient must be followed and given to the patients to lower the incidence of VTE. But, this is where the gap lies. The doctors and the nursing staff are not compliant with the provision of the VTE prophylaxis to the admitting patients.

Risk Stratification:

All adult patients admitted to hospital will be presumed to be at increased risk for VTE. All patients admitted to the hospital will undergo a risk screening, by the Resident Doctor/Consultant.

Responsibility (Who tracks VTE??) :

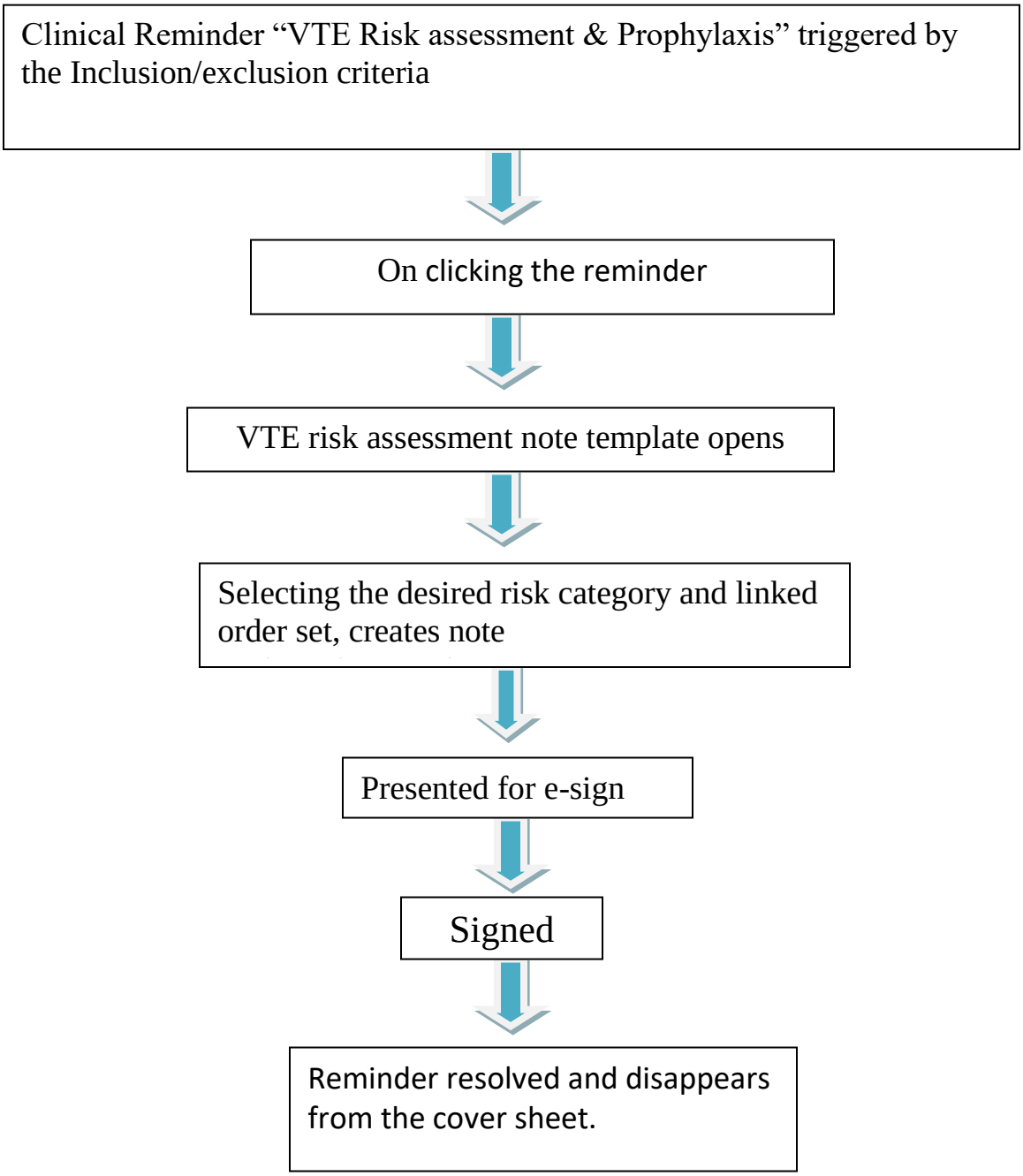
Admitting Physicians

How Non tracking is maintained??

Electronic Alerts (Max Hospital, Dehradun) :

An 'Electronic Alert' system is being planned for institution of VTE prophylaxis on admission, as these have been shown to significantly increase compliance. An electronic pop-up would appear in the CPRS system which mandates that the clinician has to order VTE prophylaxis for every adult patient (or justify in writing why it is not required, or not being given). Hospitals are strongly advised to adopt the same.

Workflow in Computerized Patient Record System:



LITERATURE REVIEW:

Venous Thromboembolism (VTE) is categorized by the U.S surgeon General as a major public health problem. VTE is relatively common and associated with reduced survival and substantial health care costs and recurs frequently. VTE is a complex (multifactorial) disease, involving interactions between acquired or inherited predispositions to thrombosis and VTE risk factors, including increasing patient age and obesity, hospitalization for surgery or acute illness, nursing home confinement, active cancer, trauma or fracture, immobility or leg paresis, superficial vein thrombosis and in women, pregnancy and puerperium, oral contraception and hormone therapy. Although independent VTE risk factors and predictors of VTE recurrence have been identified, and effective primary and secondary prophylaxis is available, the occurrence of VTE seems to be relatively constant or even increasing. (John A. Heit, 2016)

According to the author Dr William Geerts , Sunny Health Sciences Centre, The last 50 years have witnessed a multitude of publications evaluating the efficacy, safety and cost effectiveness of many different thromboprophylaxis interventions. There is widespread consensus that thromboprophylaxis safety reduces morbidity and mortality. As a result thromboprophylaxis is recognized as a key safety priority for hospitals. Despite of overwhelming evidence supporting thromboprophylaxis , rates of thromboprophylaxis use remain far from optimal. successful implementation strategies to bridge this knowledge, care gap are the important current challenges in this area (Geerts, 2009)

As per the Journal of thrombosis and hemostats aging itself is a factor for venous thromboembolism and the prevalence in the elderly of additional risk factors increase its intrinsic risk, Many in the medical community are reluctant to prescribe anticoagulation (for primary and secondary prevention of venous thromboembolism) to geriatric patients for the fear that bleeding complications may outweigh the benefits. (G. Di Minno, 2003)

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?

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.

METHODOLOGY:

Sample size : The sample size for the study is 726 inpatients.

Sampling : Purposive sampling, 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 Superspeciality 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.

RESULTS AND INTERPRETATION:

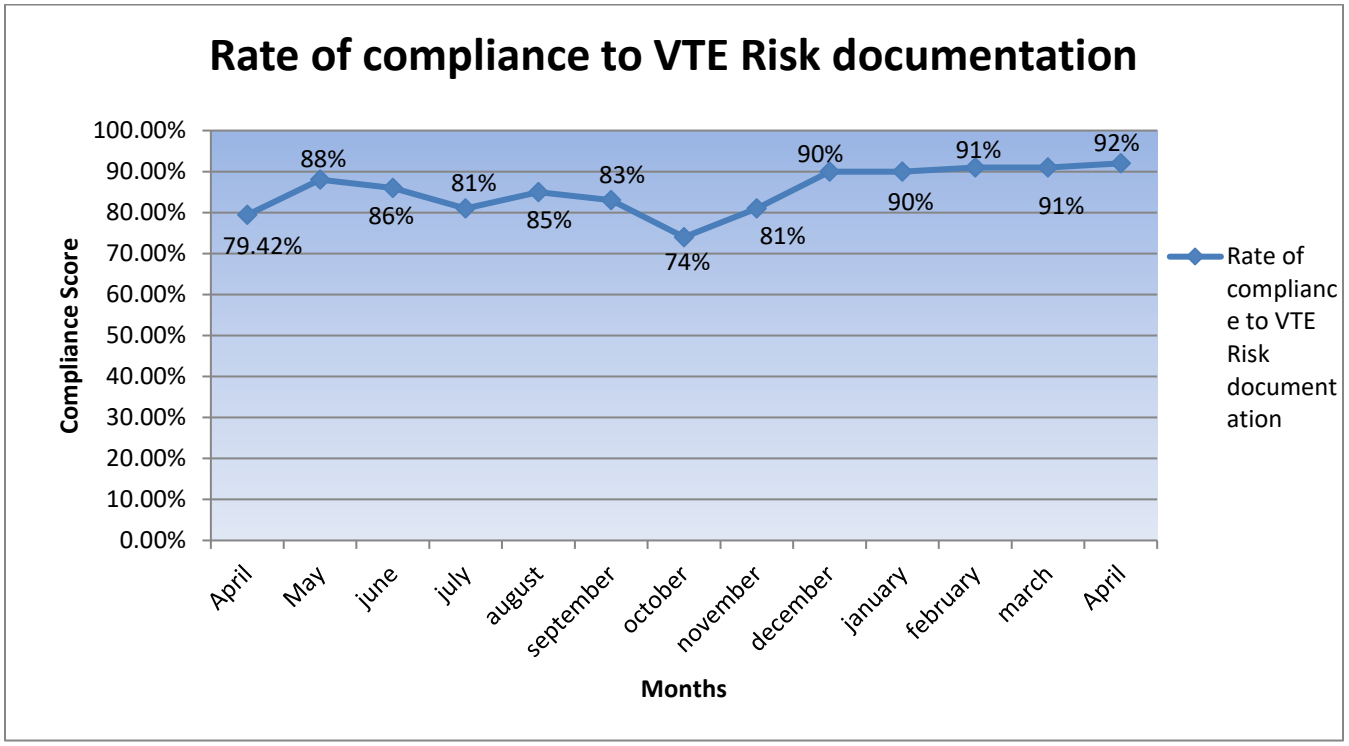


Fig 1: **Rate of compliance to VTE Risk documentation**

The data shown from April 2017- Jan 2018 is secondary data.

The lowest score of rate of compliance to VTE risk documentation **from April 2017 to April 2018** was on October i.e 74% and the highest was in April 2018 i.e 92% which is very close to the progress against target which is 100%

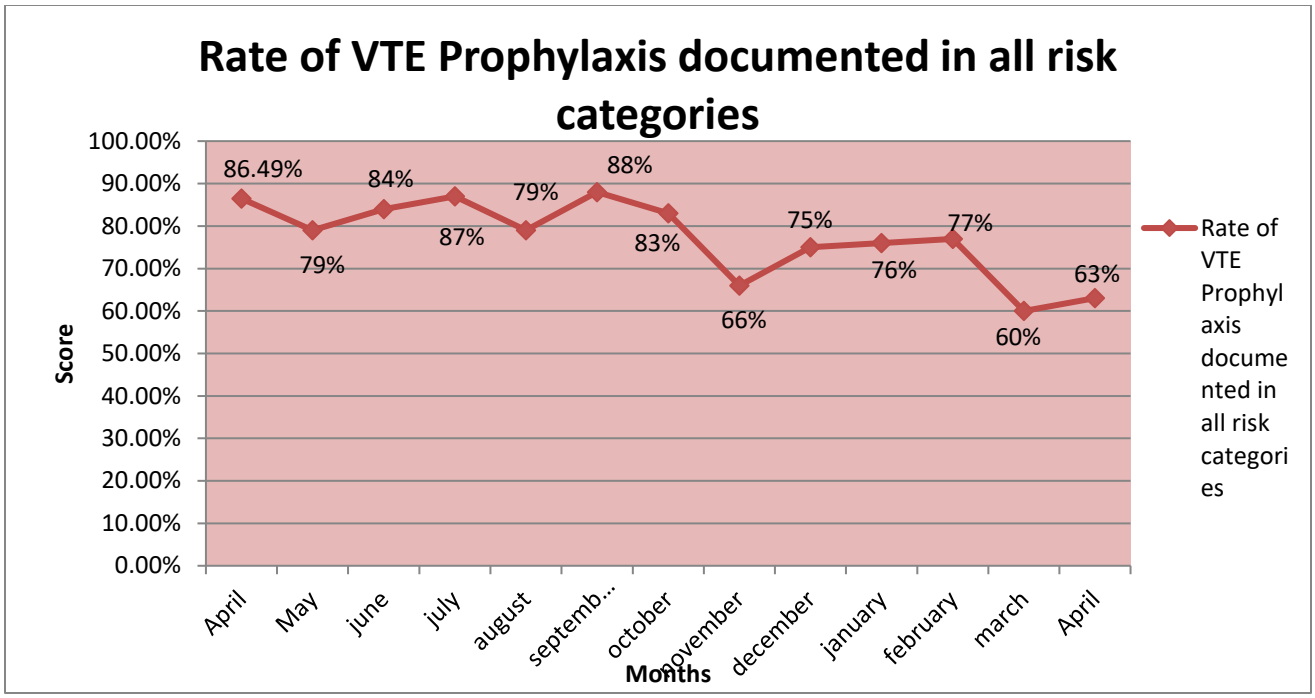


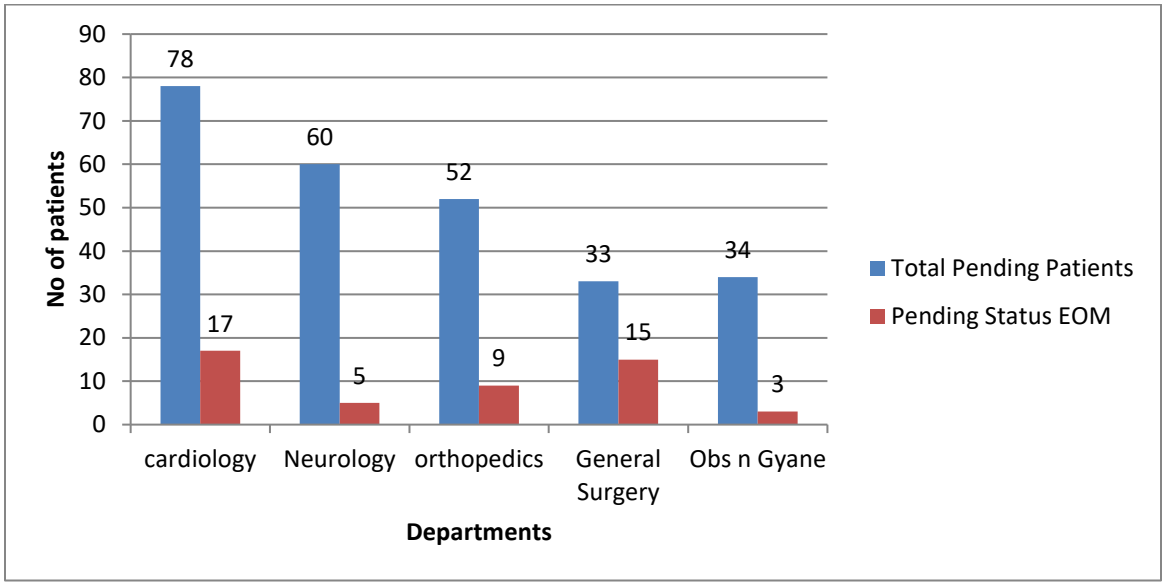
Fig 2: **Rate of VTE Prophylaxis documented in all risk categories**

The data shown from April 2017- Jan 2018 is secondary data.

The lowest score of Rate of VTE Prophylaxis documented in all risk categories is 60% in March and highest is seen in September i.e 88%. By April 2018 the score came down to 63%.

MonthS	Rate of compliance to VTE Risk documentation	Rate of VTE Prophylaxis documented in all risk categories
April	79.42%	86.49%
May	88%	79%
June	86%	84%
July	81%	87%
August	85%	79%
September	83%	88%
October	74%	83%
November	81%	66%
December	90%	75%
January	90%	76%
February	91%	77%
March	91%	60%
April	92%	63%

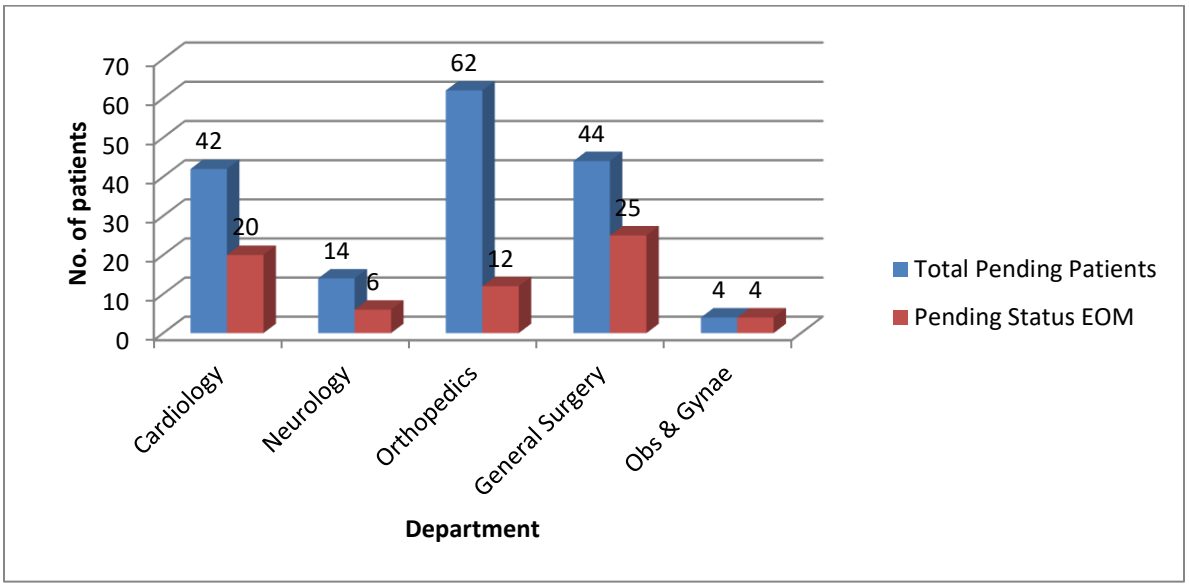
Feb 2018: (Fig 3- Graphical representation of total pending patient's vs number of pending status of VTE EOM.



Feb-18					
Department	cardiology	Neurology	orthopedics	General Surgery	Obs n Gyane
Total Pending Patients	78	60	52	33	34
Pending Status EOM	17	5	9	15	3

INTERPRETATION: Out of all the departments cardiology has highest pending patients in the month of feb and out of which 17 patients (22%) VTE status is pending even after multiple reminders and the lowest number (34) of patients are seen in Obs & Gynae where 3 (10%) patients VTE status is pending EOM.

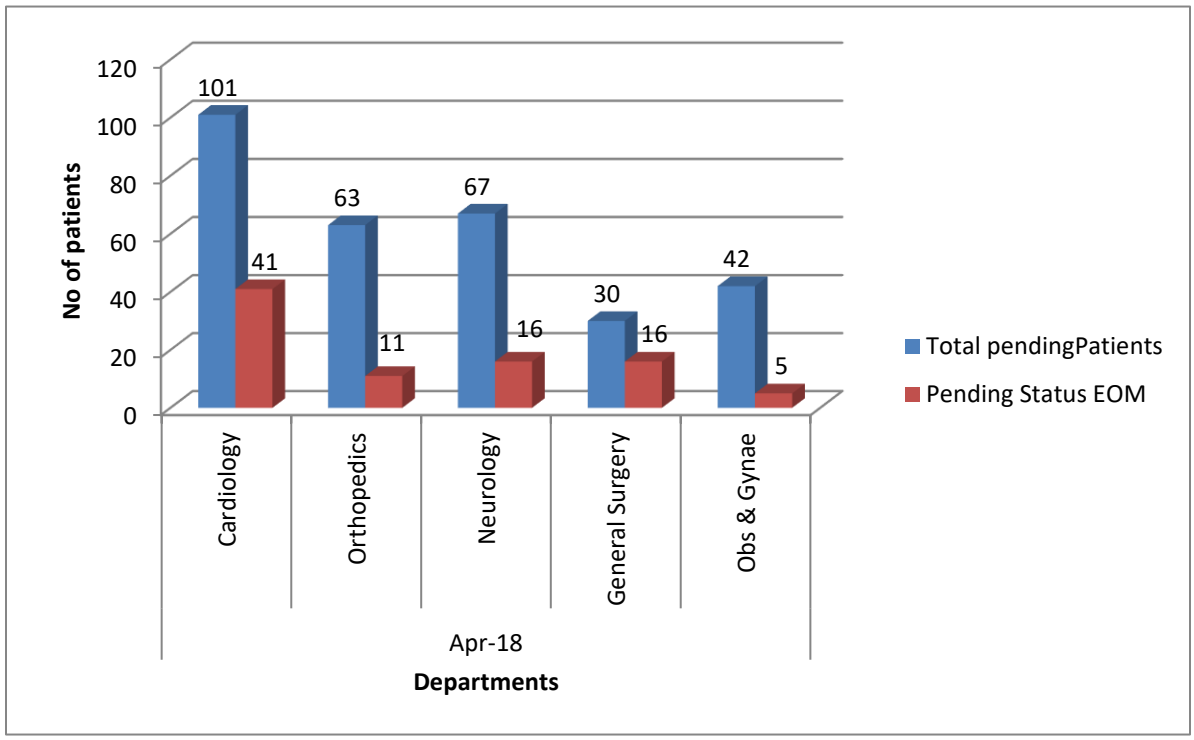
March 2018: (Fig 4- Graphical representation of total pending patient's vs number of pending status of VTE EOM.



18-Mar					
Department	Cardiology	Neurology	Orthopedics	General Surgery	Obs & Gynae
Total Pending Patients	42	14	62	44	4
Pending Status EOM	20	6	12	25	4

INTERPRETATION: In the month of March highest pending patients are seen in orthopedics in which 12 patients status is pending and lowest patients are seen in obs and gynae (4) and all the 4 are pending.

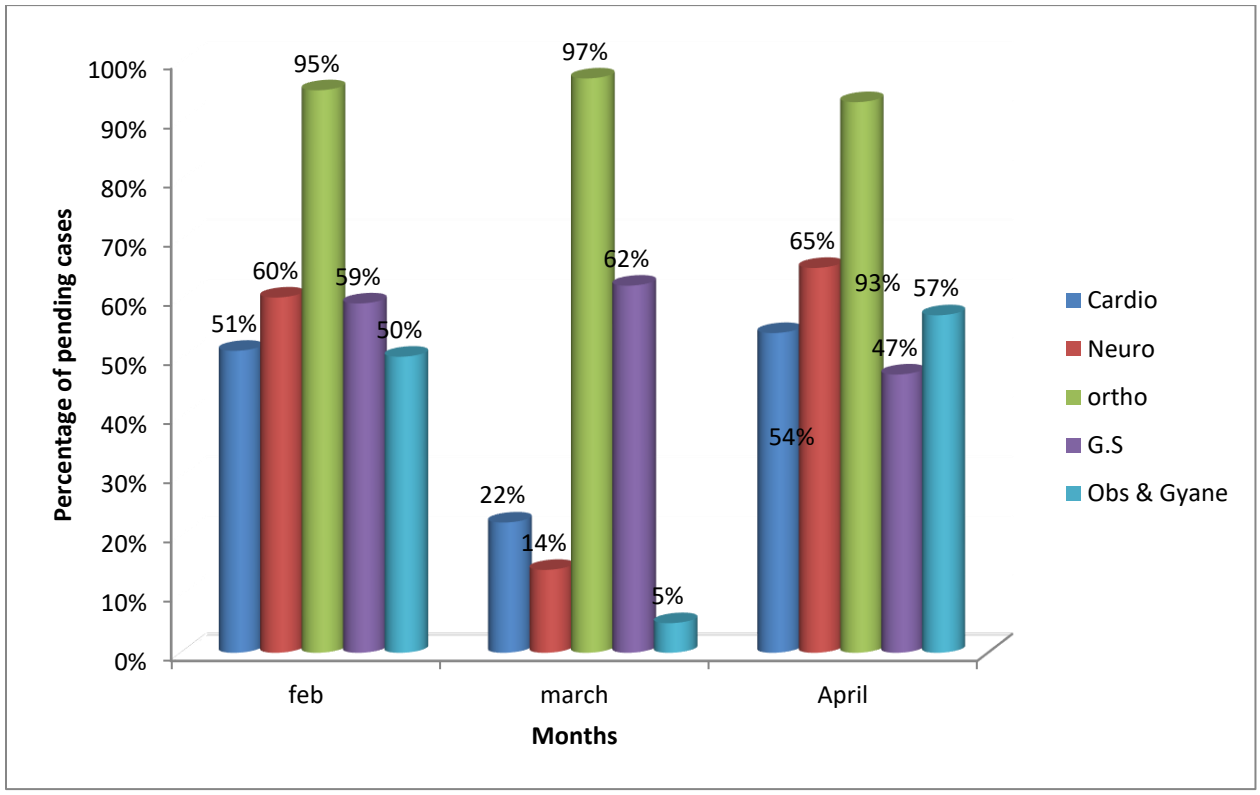
April 2018: (Fig 5- Graphical representation of total pending patient's vs number of pending status of VTE EOM.



	Apr-18				
Department	Cardiology	Orthopedics	Neurology	General Surgery	Obs & Gynae
Total Pending Patients	101	63	67	30	42
Pending Status EOM	41	11	16	16	5

INTERPRETATION: In the month of april the highest pending patient were in cardiology in which 41 status is pending EOM which is 41% and the lowest is seen in general surgery where 30 patients were admitted patients status is pending and 16 patients status is pending EOM i.e 53%

Pending non compliance for three months:Fig 6



Interpretation: It indicates that there were significant reduction of non compliance in the departments from feb to march but the same were again increased in the month of April

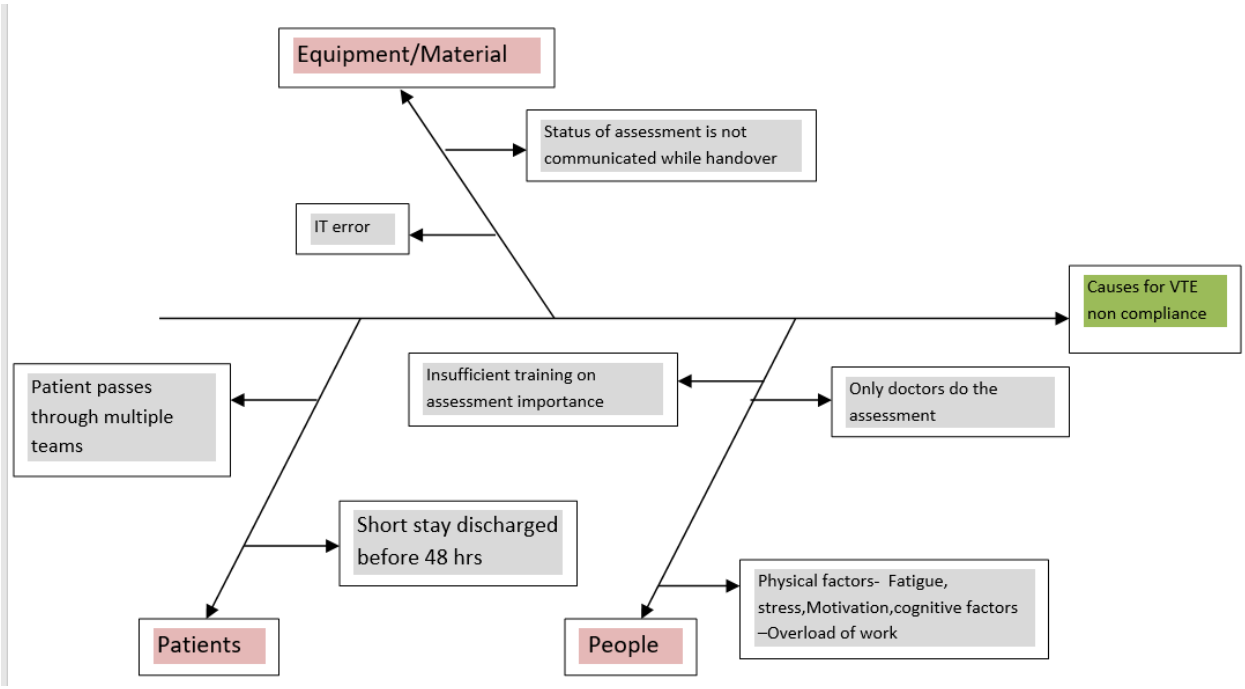


Fig:7 Root cause analysis

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

P1 &

P2 = TOTAL NUMBER OF NON COMPLIANCE CASES AT TWO CONSEQUETIVE TIME POINTS

N1 & N2=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 February, 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

		p1	n1	p2	n2	(n1*p1)+(n2*p2)	p0	q0	p0*q0	(n1+n2)/(n1*n2)	sp1-p2	Z	Results
Feb- March	cardio	0.5098	153	0.22	191	120	0.349	0.651	0.227	0.012	0.108	2.672	Accepted
	neuro	0.6	100	0.14	100	74	0.37	0.63	0.233	0.02	0.141	3.2527	Accepted
	ortho	0.9455	55	0.969	64	114	0.958	0.042	0.04	0.034	0.184	-0.127	Rejected
	gs	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	cardio	0.2199	191	0.54	187	143	0.378	0.622	0.235	0.011	0.103	-3.113	Rejected
	neuro	0.14	100	0.65	103	81	0.399	0.601	0.24	0.02	0.14	-3.636	Rejected
	ortho	0.9688	64	0.926	68	125	0.947	0.053	0.05	0.03	0.174	0.2428	Accepted
	gs	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

Fig 8

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 increase in non compliance. This was because of the following reasons

-Absence of two doctors at the same time for a long duration.

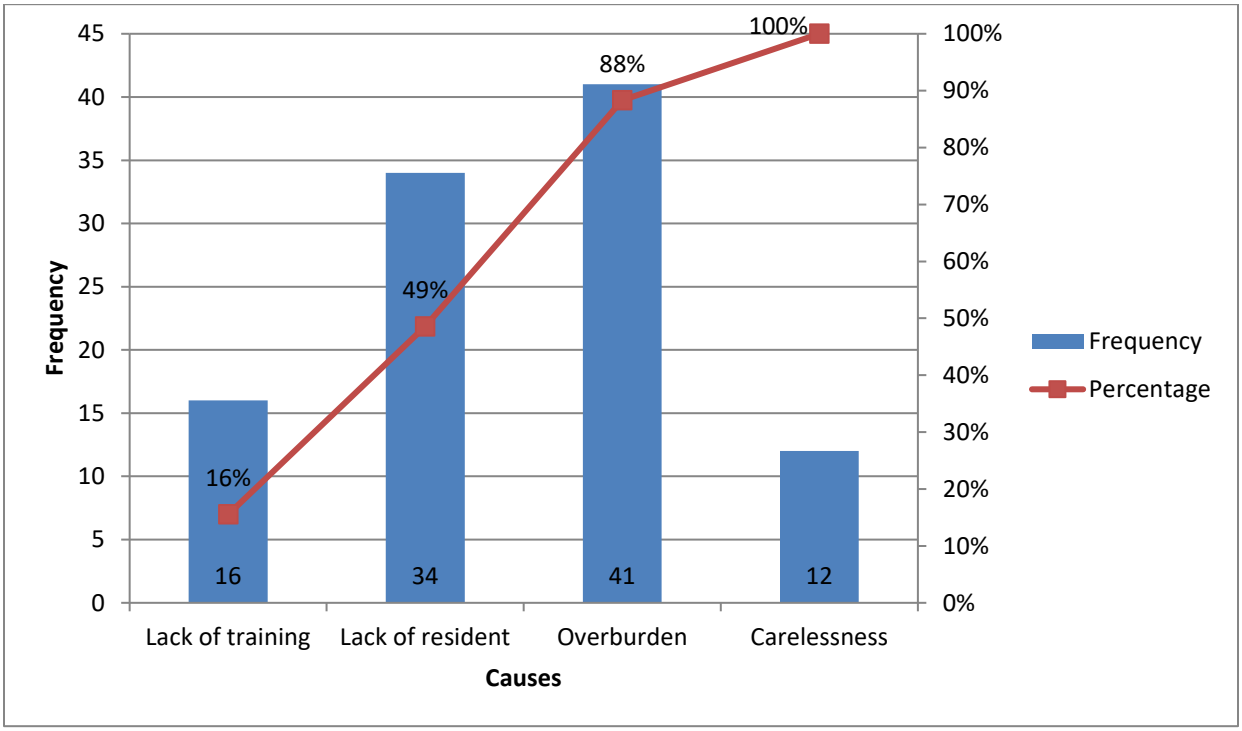
-Doctors coordinator left the job

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.

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



S.no	Reason	Frequency	cumulative frequency	Percentage
1	Lack of training	16	16	16%
2	Lack of Resident	34	50	49%
3	Overburden	41	91	88%
4	Carelessness	12	103	100%

INTERPRETATION: Above mentioned is the pareto analysis in which it is seen that the 88% of the problem is caused by the first three reasons which are Lack of training , Lack of Resident and overburden of work.

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.
- Involved residents to help in the VTE documentation.
- Nursing specialist to motivate to inform the doctors if they are occupied with work.
- Took strict actions on certain departments by Medical services.
- CME conducted on VTE.
- Started targeting discharge patients

CONCLUSION:

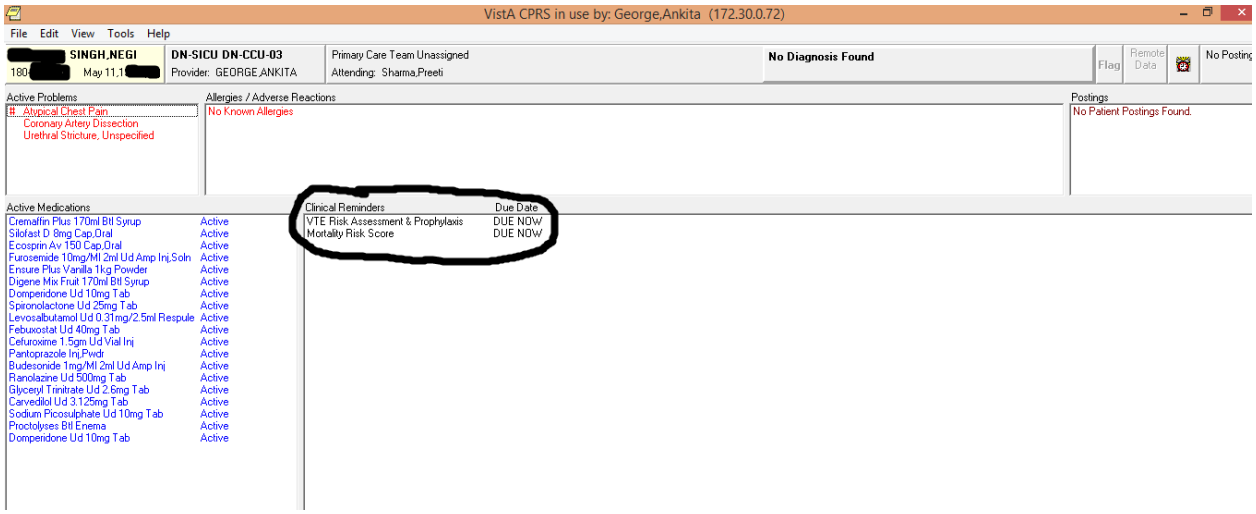
An observational study on "Venous Thromboembolism prophylaxis compliance and the challenges faced" was conducted in Max Superseniority hospital, Dehradun from Feb 12th, 2018 to May 10th, 2018, to check if the patients are being assessed for VTE risk assessment within 48 hours of admission in the hospital 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

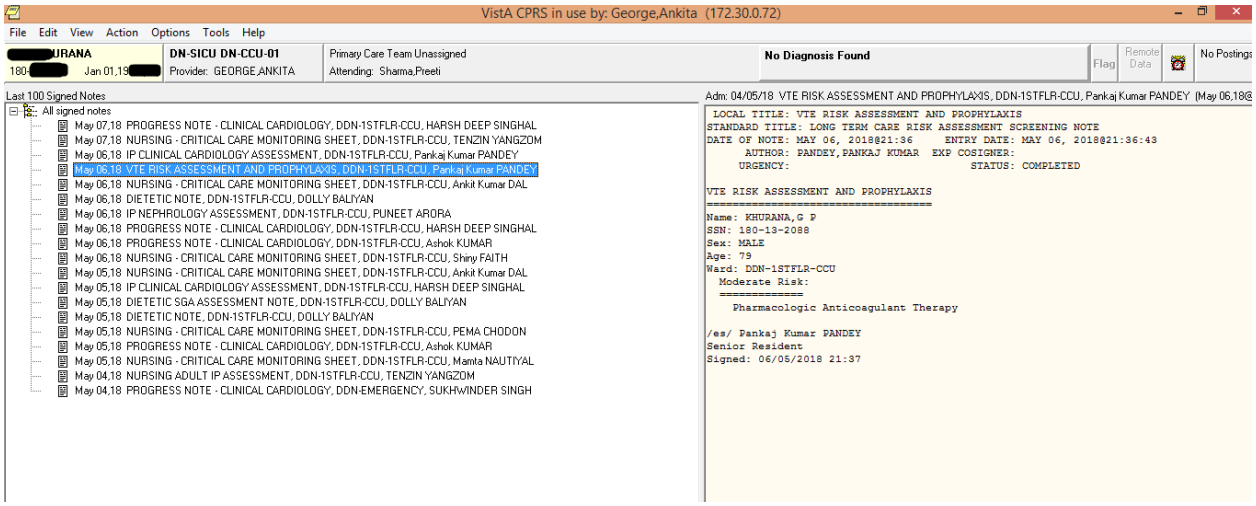
is high. It was a worrisome finding that in the departments where improvement was seen there was again a reversal of pendencies which was statistically significant thus indicates that regular follow up has to be continuously done and any dilutions in the same would be detrimental to compliances.

Annexures:

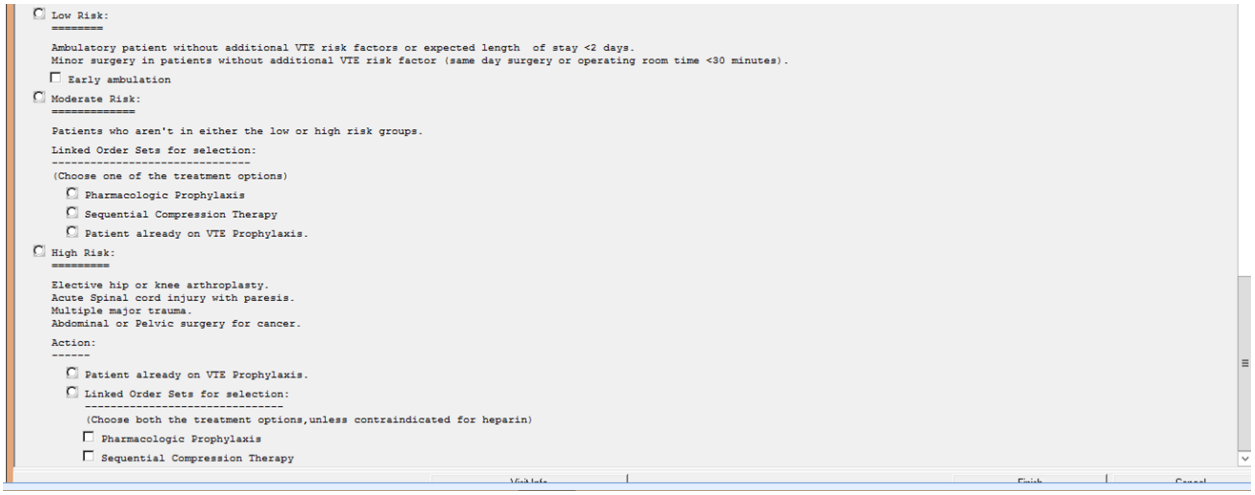
-The cover sheet on CPRS where the pop up is shown of the VTE prophylaxis is due.



Below mentioned is the case in which VTE prophylaxis has been assessed.



-These are the prophylactic measures according to the VTE status of the patients.



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