

CDS Approach for Optimizing VTE Prophylaxis (VTEP) Society of Hospital Medicine (SHM) Recommendations¹ Version 2; March, 2013

Target =	> 95% with VTE Prophylaxis per protocol
Current Performance on Target =	60% or so in typical hospitals

		Optimal State (sample activities to optimize performance)			Current State (Your current CDS/QI configuration)					Enhanced State (improvements you could implement)			
Decision Support Opportunity		Care Activities	Examples of Care Activities	Notes	CDS 5 Rights					Notes			
					Who? (people)	What? (information)	Where? (channels)	How? (Formats)	When? (Workflow)				
Patient-specific Activities	Not Admission-related												
	Pre-hospitalization												
	Emergency Department												
	During Hospitalization	Registration/ Intake											
		History/ Assessment	Assess clot risk, bleeding risk, and mitigating factors (e.g., end of life issues). Do this as a single integrated step tied to the ordering process.			Order Set with Embedded Smart Documentation Form: Use a "3 bucket" model of VTE risk (see next column), with each level of VTE risk directly linked to appropriate VTEP options, and a specific "opt out" for contraindications (see 'Orders' row below). · This tool is filled out by admitting / ordering provider as they write admission / transfer / period orders; this ties VTE risk assessment and appropriate VTEP ordering directly to the admit / transfer / post op process.	Selection of the VTE Risk level is directly and specifically linked to the acceptable options for that level of VTE risk. This linkage is ideally seamless in space, time, and workflow. (Options may be nested immediately under VTE risk level, or choosing risk level leads to a separate screen displaying acceptable options).			Forcing function capability requires that a VTEP protocol option is selected and tied to VTE risk, or reason why patient is not a VTEP candidate is documented. Activity orders / ambulation orders and activity restrictions are available, are standardized and reconcile with standardized documentation of activity / ambulation / mobility.			
		Documentation	Risk for VTE captured with order, as well as prophylactic choice or opt out.			Documentation is a by-product of ordering, as above/below.			Ideally, risk level is transmitted from ordering system to MAR for display and review by nurse. Use patient-specific risk level as a discrete, searchable field for reporting and QA.	Provide ability to transmit patient VTE risk from CPOE module to eMAR module, and to display patient risk along with corresponding interventions within the eMAR. Ensure this information is available as discrete, searchable fields for reporting and QA. Standardized documentation of activity/ambulation orders/ restrictions. Reconcile with patient needs/condition/risk.			
		Care planning/ Patient Education/ Shared Decisions	Determine appropriateness and duration of anti-coagulation medications			[The default assumption is that VTEP will continue for the duration of the hospitalization. A decision point is what will happen after discharge. Measure-vention (see 'Results/Monitoring/New Events') below helps ensure this is the case]							
		Ordering	Orders are directly linked in time / space with risk assessment: i.e., the preferred prophylaxis approach is presented directly adjacent to each corresponding risk level, so selecting a risk level drives selection of the appropriate VTEP			Menu of orders for VTEP directly linked to risk level itself, as above. For example: · Low VTE risk intervention choices - such as "No specific interventions, encourage ambulation, reassess on a regular basis" - appear nested or otherwise directly linked to low risk description · Moderate VTE risk intervention choices - like UFH 5000 q 8 hours or LMWH (such as enoxaparin 40 mg / day) OR option/tool for prescriber to declare and document contraindication to AC and choose SCDs - appear nested under or are otherwise directly linked to moderate risk description. · High VTE risk intervention choices - like LMWH AND SCDs, Warfarin AND SCDs, etc. OR option/tool for prescriber to declare and document contraindication to AC and choose SCDs - are nested under or are otherwise directly linked to high risk description. Consider providing recommended renal impairment dose adjustments for pertinent medications (e.g. heparin, enoxaparin) on order set.			Consider dose checking at ordering, dispensing or both for AC drugs requiring renal adjustment.			· VTEP orders should be embedded in Admit / Transfer / Post-operative orders in such a way that they appear in normal work flow at these critical junctures; there should be a "hard stop" in the workflow to ensure that the VTEP order set is completed for each patient. · Capture stated VTE risk AND modality ordered AND stated absence or presence of contraindications to AC. This can be useful because you can: · Get insight into what the ordering provider was thinking, and · Monitor % of patients that are low / moderate / high risk as observed by ordering clinician vs. independent review....this can help you target training / education.	
		Care Plan Execution (e.g. Testing, Med Dispensing/Admin)	1. Ensure anticoagulant dosing dispensed is appropriate to patient's renal function 2. Ensure appropriate VTEP is being administered for patient VTE risk 3. Provide patient education about VTEP being used (pharmacologic and/or mechanical)			1. Dosage guidance (i.e., via alert) to pharmacist on needed but unaddressed renal dosage adjustment 2. VTE risk displayed along side VTEP to be administered 3. Patient education materials on VTEP modalities available to nurse to be provided to patient during administration			Consider dose checking at ordering, dispensing or both for AC drugs requiring renal adjustment.			Provide access to educational material, algorithms, or policies, with ability to share with patient in electronic and/or paper form, conveniently within Provider workflow (nurse, doctor, pharmacist, etc.).	
		Results /Monitoring/ New Events	1. Report depicting what each patient in a hospital unit/location is actually on for VTEP, routed to front line reviewer / intervener. 2. Check adherence to mechanical prophylaxis			1. Report depicts VTE risk level (from order set), location, patient id, what patient is on for VTEP, with color coding (Green (G) = AC at therapeutic or prophylactic level, yellow (Y) = mechanical prophylaxis, red (R)= no prophylaxis or AC. · Nurse or pharmacist focuses attention on those in the "red" or "yellow". If in red, are they low risk, or have contraindications to both AC and mechanical prophylaxis? If no, action is taken. Ideally this takes place every day. "Measurement" of what patients are on spurs concurrent "Intervention", which is called "measure-vention." A similar chain of events occurs if patient is in the "yellow". If patient is not low risk, they are considered to be on inadequate prophylaxis unless they have a contraindication to preferred AC VTEP choice, and an intervention takes place. The intervention might be a scripted page to ordering provider, a templated note, or other. If patient "in the red" and at risk for VTE, nursing might be empowered to place mechanical prophylaxis while awaiting response to request for AC VTEP. 2. At same time R/Y/G process audits what is ordered, a quick check can take place to see if ordered mechanical prophylaxis is on and properly fitted. · Report can be refined to capture readily available lab contraindications (e.g. Hgb < 8, INR > 2, plt count < 50k), that may reduce the volume of false alarms from measure-vention. Measure-vention most effective when added to properly designed and implemented VTEP order set (see above).			· The 'report' can take many different formats, e.g., a paper report or a dynamic display on a monitor placed on the nursing unit. · Need to establish and enforce policies about individuals responsible for reviewing information in the report (e.g. case managers, nurses, pharmacists, etc.) and how deviations from the VTEP should be addressed. · The denominator for the report should be everyone on the ward (those on anticoagulant medication, those on mechanical prophylaxis only, and those not on VTEP). [Note: A report from pharmacy simply indicating which patients are on anticoagulants is not adequate, since it does not contain enough information to determine which patients are, and are not, receiving adequate VTEP.			Flow sheet for review of individual patient: Key pieces of data can be pulled from disparate sources and be displayed together in one report available from within the EHR. For VTEP, this includes data about patient mobility (both orders and what recent activity / mobility), declared VTE risk level, presence or absence of mechanical prophylaxis (both order and administration), and order and administration of anticoagulant drugs - all this information should be readily accessible from a single screen / flow chart. Measure-vention Report capability: Report depicts VTE risk level (from order set), location, patient id, what patient is on for VTEP. Color coding is a desirable option if available (Green = on AC at therapeutic or prophylactic level, yellow = mechanical prophylaxis, red = no prophylaxis or AC.	
Discharge/ Transfer	Determine need for ongoing VTEP after hospital discharge.			Protocol-driven discharge template covering post-discharge anti-coagulation per service (e.g., in orthopedic service or colorectal/pelvic cancer surgery). This discharge template indicates specific circumstances where evidence supports extended duration post-discharge VTEP, e.g., for post hip/knee surgery, minimum of 10-14 days, up to 35 days). Details of clinical best practice is less clear for other circumstances, so post-discharge approach to VTEP is more of an individual decision, and CDS will be useful primarily of use if there is a desire to support specific local preferences.									

	Post-discharge							
Population-oriented Activities	Outside Patient-specific Encounters	Build needed capabilities for addressing gaps broadly across patients			Conduct a root-cause analysis on all or a sampling of VTE cases identified from this tracking, with particular attention to Hospital Associated VTE and whether or not they were potentially preventable (patient was not on protocol directed prophylaxis) or "not preventable" (patient was on protocol directed prophylaxis). This audit involves assessing whether or not the patient's VTE prophylaxis was consistent with the preferred choices offered for that level of risk.			

Set-up Considerations:

- Implement training/policies to ensure that all hospitalized patients are managed using standardized VTEP/ CDS order sets .
- Admission and transfer orders must be on standardized VTEP/ CDS forms to be accepted by admitting staff/nurses/pharmacists. Embed VTEP orders in commonly used / popular admit and transfer order sets.
- Review and revise all common order sets (initially and periodically) to reflect current practice standards for VTEP. (See 3-bucket model example below). Include interdisciplinary input and education while maintaining evidence-based clinical practice guidelines.
- Modifications to local formularies, and to some extent, to specific services, can be beneficial, providing it is not overdone. Customization for services is ok, providing within bounds of evidence. Customizing for each provider within a service should not be permitted.

Abbreviations: VTE=venous thromboembolism, LOS=length of stay, hx=history, CHF-congestive heart failure, UFH=unfractionated heparin, AC=anticoagulant(s), SCD=sequential compression device, CA=cancer, LMWH=low molecular weight heparin, QA=quality assurance, CPOE=computerized provider order entry, eMAR=electronic medication administration record

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The contents of this worksheet are supplied by the Society of Hospital Medicine. Examples and concepts from Greg Maynard MD are featured in SHM and AHRQ toolkits. No definitive evidence exists to favor one risk assessment model over others, and advice is based on collaborative and local experience. While local factors and new evidence should be considered in adapting a risk assessment model, the CDS principles remain constant.

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