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QI Quality Improvement & Health Information

DIAGNOSIS OF PULMONARY EMBOLISM AND DEEP VEIN THROMBOSIS IN THE CALGARY HEALTH REGION

REPORT OF A MEDICINE QUALITY COUNCIL PROJECT TEAM

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REPORT OF THE PE & DVT DIAGNOSTIC PROCESS PROJECT TEAM: EXECUTIVE SUMMARY

- Pulmonary embolism (PE) is a fatal disorder in 30% of patients if not diagnosed and treated
- Deep venous thrombosis (DVT) leads to PE in a large percentage of patients
- Over 9000 patients are investigated for possible PE or DVT each year in the Calgary Health Region (CHR), with an estimated Diagnostic Imaging (DI) cost of $3,000,000
- Approximately 12 to 15% of patients investigated for PE and DVT are diagnosed
- It was suspected that improvements could be made to the process of diagnosing these conditions which would lead to improved patient care and greater efficiency for the CHR
- The Medicine Quality Council established a project team that used standard quality improvement methodology to investigate the process used in the three adult acute care sites for investigation of PE and DVT
- Several problems with the diagnostic process were identified
    - the current approach used for investigation of these disorders is not standardized in the CHR, possibly leading to some inappropriate test ordering
    - a substantial proportion of patients investigated for PE have 'non-diagnostic' studies which requires a second test (usually an ultrasound test of their legs) and then a follow up ultrasound test one week later. These follow-up studies are most often never ordered
    - patients seen in the emergency departments in the evenings or at night (30 to 40% of all patients) can not obtain the required diagnostic test because DI testing is not available; therefore they often have to return to the emergency room the following day for the test(s)
- To address these issues the PE & DVT Diagnostic Process Project Team are recommending:
    1. Introduce critical pathways to standardize the diagnostic process that would include clinical prediction scores, and a new highly sensitive D-Dimer blood assay along with the standard DI tests.
    2. Establish a diagnostic outpatient clinic for patients to continue investigations that patients were unable to get in the emergency room the following day
    3. Explore the feasibility of extending DI hours to reduce the number of patients that are required to return the following day for testing
    4. Establish a coordinated system for ensuring that follow-up leg ultrasounds, when recommended by the critical pathways are performed at the right time and that those patients who have positive studies are appropriately referred to the anticoagulation clinic.
    5. Explore with Private DI clinics the feasibility of performing the recommended follow-up leg ultrasounds in a private diagnostic facility
- It is anticipated that the introduction of a new critical pathway that includes the D-Dimer assay will reduce demand for DI testing in the acute care sites by 28 to 56% resulting in an anticipated saving of approximately $800,000 that is offset by lab costs estimated at $200,000
- It is estimated that a .5 FTE RN could provide coordination of next day diagnostic testing and one week follow up ultrasounds. Providing a "single point of contact" for both emergency departments and patients to contact will have the advantage of reducing the number of patients reaccessing the emergency departments for diagnostic testing, as well as work towards alleviating patient frustration

- The key stakeholders involved in the PE/DVT diagnostic process that need to be informed and involved with these recommendations in order to ensure effective implementation include:
    - Calgary Lab Services – have participated in the project team, are ready to implement D-Dimer, and have previously budgeted for the D-Dimer assay
    - Diagnostic Imaging – several changes in the DI testing process have been recommended that would affect both the acute care sites and private facilities
        - examine the feasibility of extending DI hours
        - reduction in the number of ultrasound and V/Q lung scans ordered
        - change the reporting of V/Q lung scans to high, non-high, normal
        - to facilitate ongoing, prospective data collection and reporting, DI test results will have to be coded into DI databases
        - possible increase in the number of pulmonary angiograms ordered
        - examine the feasibility of performing follow up (1 week) leg ultrasound tests
    - Emergency Room Departments
        - follow the critical pathways proposed by the project team
        - referring patients to a next day diagnostic clinic, if it is established, rather than arranging for patients to return to the emergency department
        - If patients who require further diagnostic testing the following day are discharged from the ER; a policy should be implemented that all patients receive a single dose of low molecular weight heparin
        - provide the same access to diagnostic testing for the next day diagnostic clinic as the ER currently has
        - determine the most appropriate location (acute care site or private clinic) where the 1 week follow up ultrasound testing can be performed
    - Ambulatory clinics in the CHR
        - create a new position for a nurse to
            - coordinate next day diagnostic testing at each of the three acute care sites and a physician appointment on that same day (estimate of 19 patients per week – 7 @FMC and 6 each @ PLC and RVH)
            - coordinate 1 week follow up ultrasound tests for patients (estimate of 35 patients per week in the Region)
            - arrange appropriate follow up and treatment for patients who test positive on their one week follow up ultrasound test
        - use existing clinic space and resources for seeing the patients
    - Medical specialists
        - at each site arrange a rota where one specialist will see between 1 to 3 patients, referred from the emergency room, in a single half day clinic
        - participating specialties – General Internal Medicine, Pulmonary, Hematology
        - Department of Medicine Site Chiefs to organize the rota and provide it to the next day diagnostic clinic coordinating nurse
- Budget
    - new funding for a 0.5 FTE RN to coordinate next day diagnostic testing and 1 week follow up ultrasound testing
    - salary and benefits - $36,000
- Key quality indicators will be reported in run charts to track the impact of these recommendations. These indicators will include numbers of: tests ordered and results, patients with indeterminate results who receive an additional test, patients with a non-high V/Q scan who are booked for a follow-up ultrasound study of their legs in one week, emergency room patients referred to a next day diagnostic clinic