Policy, Procedure and Protocol

Policy Title: QTc Interval Monitoring **Department: Pharmacy**	**Function Team: Medication Management** **Effective Date: 11/15**
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Approvals: __X__P&T __X__MEC	

1. PURPOSE:

   1.1. To establish a protocol and process by which the Pharmacy, Medical Staff and Nursing departments can monitor QTc intervals in patients at high risk for QTc prolongation and subsequently decrease the risk for sudden cardiac death

2. POLICY:

   2.1. The Policy, Procedure and Protocol (PPP) will be utilized selectively and appropriately by the Pharmacy, Medical Staff and Nursing staff in order to evaluate and monitor patients at high risk for QTc prolongation and decrease their risk for arrhythmias and sudden cardiac death. Specific indications for application of this PPP include:
   2.1.1. Patients receiving two or more medications known to prolong the QT interval
   2.1.2. Patients with a known history of any one or more of the following conditions:
   2.1.2.1. Sudden Cardiac Death
   2.1.2.2. Torsades de Pointes
   2.1.2.3. History of QT Prolongation / Long QT Syndrome (LQTS) / Repolarization Disorders
   2.1.2.4. Recent /current 12 Lead ECG indicates QTC greater than 450ms (males) and 460ms (females).

3. PROCEDURE:

   3.1. PHARMACIST ASSESMENT

   3.1.1. Assessment for the need to monitor and report patients' QTc Intervals will be conducted by Pharmacy on a daily basis
   3.1.2. All patients receiving two or more scheduled medications known to cause and/or exacerbate QTc Interval prolongation will be evaluated by the Pharmacist daily
   3.1.3. The Pharmacist will determine based on the patient's condition, drugs ordered, dose, route, frequency and interactions whether or not QTc Interval monitoring is warranted
   3.1.4. If based on the Pharmacist's assessment, QTc Interval monitoring is warranted, then the Pharmacist shall obtain a QTc interval is available
   3.1.5. If a QTc is not available then the Pharmacist shall contact a physician and obtain an order for the "QTc Interval Monitoring Protocol"

   3.2. NEW ORDER FOR QTc INTERVAL MONITORING
   3.2.1. Whenever the "QTc Monitoring Protocol" is ordered by Pharmacy, the nurse shall measure the patient's baseline QTc interval utilizing the "QTc Interval Monitoring Protocol"

   3.3. QTc INTERVAL MONITORING PROTOCOL

3.3.1. SPECIFIC ECG MEASUREMENT CRITERIA

3.3.1.1. The ECG tracing should

3.3.1.1.1. Be recent - obtained within the past 24 hours (ideally past ONE hour)
AND

3.3.1.1.2. When the 12 Lead ECG used, the value displayed for the "QTc" should be used.
--OR--

3.3.1.1.3. **IF** telemetry ECG is used, the tracing must be from Modified Chest Lead (MCL) 2 or 3. (Brown lead) and must be positioned in the V2 location (4th Intercostal space to the LEFT of the sternum) or V3 position (half way between V2 and V4 [5th intercostal space, mid-clavicular]).

3.3.1.1.3.1. If a patient is not currently on telemetry but meets criteria for implementation of this protocol, then the patient shall be converted to telemetry status per protocol

3.3.1.2. If a U Wave is visible on the ECG tracing, it must be included in the QT interval measurement if any of the following criteria is met:

3.3.1.2.1. The U wave is the same amplitude (size) of the T wave or is larger

3.3.1.2.2. U wave is 1mm or more in size

3.3.1.2.3. U wave is merged with the T wave.

3.3.2. QTc Prolongation Criteria

3.3.2.1. The QTc Interval is considered to be **prolonged** if any of the following criteria are present:

3.3.2.1.1. QTc Interval exceeds 450ms in male patients or 460ms in females. Caution and continuous QTc interval monitoring utilizing rhythm strips per protocol, shall be used with these patient populations prior to initiation/continuation of QTc prolonging medications

3.3.2.1.2. If the telemetry obtained ECG yields an unclear or questionable result, it is appropriate to obtain a 12 Lead ECG for a more clear measurement. The Pharmacist may order a 12 Lead ECG per protocol for the purpose of obtaining a more accurate QTc interval

3.3.2.1.3. Administration of a QTc prolonging medication when the QTc is greater than 500ms is generally considered a contraindication to therapy and should be avoided if possible. Additionally, if the QT Interval is greater than ½ of the R-R interval in patients with normal heart rates and normal QRS duration (60-100 and < 120ms), then the QTc interval is generally considered prolonged and the administration of QTc prolonging medications may be considered a contraindication to therapy

3.3.3. INTERVENTION

3.3.3.1. If the QTc is determined to be >500ms based on the criteria above, then the Pharmacist shall contact the Nurse caring for the patient or the Charge Nurse and instruct them to hold the medication per protocol until the Pharmacist has contacted the prescriber to make recommendations

3.3.3.2. The Pharmacist shall assess the patient, call the prescriber and make recommendations based on the patients current situation

3.3.4. PROCESS

3.3.4.1. Pharmacist assessment

3.3.4.2. QTc Interval Monitoring Protocol ordered

3.3.4.3. Nurse assesses the baseline QTc interval and reports the value to the Pharmacist

3.3.4.4. Pharmacist assesses the value and determines what course of action to take per protocol:

3.3.4.4.1. No further monitoring is necessary

3.3.4.4.2. Continuous telemetry monitoring with periodic QTc interval measurements once a shift by the Nurse.

3.3.4.4.3. Baseline 12 Lead ECG followed by Continuous telemetry monitoring with periodic QTc interval measurements once a shift by the Nurse

3.3.4.4.4. Pharmacist shall call the provider with recommendations if a change in therapy is needed

3.3.4.5. Pharmacist will follow up with the Nurse once a day to obtain and interpret the QTc interval value

3.3.4.6. Pharmacist may discontinue the QTc Interval Monitoring Protocol according to Clinical Judgement

3.4. Medications known to prolong the QTc interval that are used at this facility. These medication will be programed into the Sentri7 software program that will be monitored by Pharmacy on a daily basis:

Albuterol	Lithium
Amiodarone	Memantine
Amitriptyline	Methadone
Aripiprazole	Metronidazole
Atropine	Mirtazapine
Azithromycin	Nortriptyline
Baclofen	Octreotide
Budesonide	Olanzapine
Bupivacaine	Ondansetron
Celecoxib	Oxybutynin
Chlorpromazine	Oxycodone
Cilostazol	Paroxetine
Cinacalcet	Perphenazine
Ciprofloxacin	Prednisone
Citalopram	Prednisolone
Clarithromycin	Procainamide
Clonidine	Prochlorperazine
Disopyramide	Propafenone
Donepezil	Propofol
Doxepin	Quetiapine
Dronedarone	Quinidine
Droperidol	Quinine
Erythromycin	Risperidone
Famotidine	Rocuronium
Flecainide	Ropivacaine
Fluconazole	Salmeterol
Fludrocortisone	Sertraline
Fluoxetine	Sevoflurane
Formoterol	Sotalol
Fosphenytoin	Sumatriptan
Furosemide	SMZ/TMP
Galantamine	Terbutaline
Glycopyrrolate	Thiothixene
Haloperidol	Tiotropium
Hydrocodone	Tizanidine
Ibutilide	Trazodone
Imipramine	Trifluoperazine
Ketoconazole	Venlafaxine
Levalbuterol	Voriconazole
Levofloxacin	Ziprasidone

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