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Arrhythmia of Algorithm: NICU and Artificial Intelligence

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Abstract:

An algorithm is helpful in clinical medicine but may create havoc if overutilized. A scenario of a daily round in a NICU is presented to make us think about the overuse of artificial intelligence and machine learning in medical practice.

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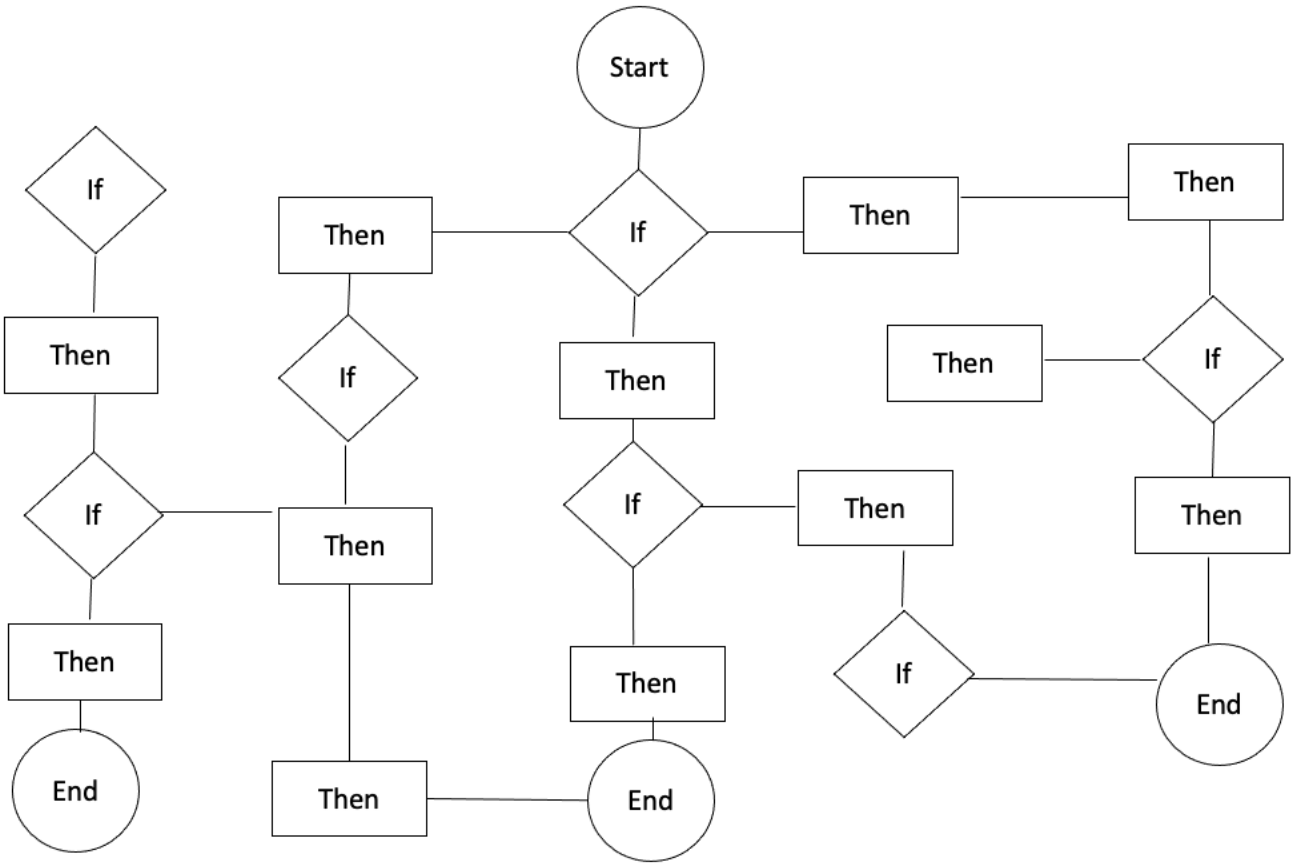
The team is rounding in NICU, and a preterm infant reportedly has low blood pressure (39/21 mm Hg).

The attending asks the intern, "What should we do now?"

The intern browses through the portable computer (computer on wheels -COW) and says, "If the diastolic is low, we should consider dobutamine, and if systolic is low, then we should consider dopamine, and if both are low, we should consider epinephrine or norepinephrine. It also depends if we need alpha 1 agonist or beta 2 antagonist."

The consultant requests to see the algorithm, and the intern shows him the picture on the COW's monitor (Figure)



After back-and-forth questioning and answering, they agreed to use vasopressin, which does not act through these alpha or beta receptors. The intern tries to order the medication through the computer. The clinical decision support (CDS) advise box appears, saying, please check if the patient has good urine output. The intern marks that box as "yes." Then the CDS prompt box says, does the patient have the syndrome of inappropriate ADH? The intern checks "no." The CDS box says the dose should be low as the patient is a premature infant. The intern adjusts the dose. The CDS box says this dose is high for this patient, with a creatinine level of 0.9 mg/dL and urea nitrogen of 32 mg/dL. The intern, in frustration, called the pharmacist and requested that she place the order for him. The pharmacist says, “It will be a verbal order, and we have already exceeded the quota for meaningful use of computer order entry, so he must enter it. He returns to the chart and realizes that the admitting staff had wrongly entered the neonate’s weight. He corrects the weight and then finalizes the order. The pharmacy dispenses the medication, and just before the drug is given, the nurse tells the intern that the BP cuff used for blood pressure in this premature infant is wrong. Using the age-appropriate cuff, the infant has normal blood pressure (48/32 mmHg).

All is good what ends good, but a good clinical history, a complete physical examination, the use of the right skills and equipment in assessment, and correct documentation could have avoided this arrhythmia of the algorithm.

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