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Title: Measurement of Residual Charcoal in Container after Administration In High Fidelity Patient Simulation Evaluation for Improvement after Education

Background: Activated charcoal is one of the most commonly used interventions in toxicology. It is used to adsorb xenobiotics in the gastrointestinal tract and to limit absorption or to interrupt enterohepatic and enteroenteric recirculation. It is typically prepared as a suspension and administered from prepackaged containers. Often the charcoal forms a hard sediment at the bottom of the container, which results in partial administration of the total labeled dose. Appropriate preparation and administration of activated charcoal is necessary to ensure delivery of the intended dose.

Aims: Primary outcome: quantify (in grams) the amount of residual activated charcoal solution present in a prepackaged container after preparation for administration by subjects compared to the amount of residual charcoal solution present after preparation for administration by the same subjects instructed on labeled preparation and administration technique.
Secondary outcome: quantify (in grams) the amount of residual activated charcoal solution present in a prepackaged container after preparation for administration by subjects compared to the amount of residual charcoal solution present after preparation for administration by the same subjects instructed with a novel administration technique.

Methods: Five nurses will participate in a high fidelity simulation scenario in which they are asked to triage an overdose patient, record their initial vital signs, and prepare a 25 gram dose of activated charcoal for administration in a dosing cup. Prior to initiating each scenario the total weight of the activated charcoal solution and container will be determined. During the first simulation the subjects will prepare the charcoal for administration without any instructions aside from those on the product label. Prior to the second scenario each subject will watch a brief video instructing them to vigorously shake the container for 2 minutes prior to preparing it for administration. Prior to the third scenario the subjects will watch a brief video instructing them to shake the product vigorously for 2 minutes, cut off the top, and stir the product with a tongue depressor until adequately mixed before preparing the product for administration. At the completion of each scenario the container and any residual contents will be weighed. After removing the residual contents the weight of the dry bottle will be determined. The dose prepared for administration and residual dose will be reported.

Major Limitations/Questions: Our institution uses a hard, rigid plastic container of Insta-Char. Other charcoal products are available and it is unclear how much variation exists between the different products. The performance of our nursing staff may vary when involved in direct patient care versus a simulated scenario. We will not conduct a follow up evaluation limiting our ability to assess for retention of education. Additionally, the product will not be administered to patients, limiting our ability to assess if the entire dose prepared is able to be administered.