Epinephrine in Anaphylaxis: Process for Safe and Cost-Effective Use
Sibley Memorial Hospital -- Johns Hopkins Medicine

Program/Project Description.
What was the problem to be solved?
How can we best address treatment of patients with anaphylaxis?

How was the problem identified?

What baseline data existed?
Anaphylaxis is a relatively rare event.

What were the goals – how would you know if you were successful?
The goal was to avoid medication misadventure during the treatment of anaphylaxis. Consistent administration of the appropriate epinephrine dose via an appropriate route in the emergency setting of anaphylaxis is the true measurement of success.

Process.
Primary literature review and benchmarking data set the strategic stage. Process transformation was created via a multidisciplinary work group consisting of pharmacy, nursing, medical staff, and education and training.

Solution.
What solution was developed?
Every code cart now contains two "home-grown" anaphylaxis kits containing one milligram ampule of epinephrine, filter needle, 1 mL syringe with needle, and an alcohol swab. In addition, each kit contains step-by-step instructions for how to calculate, prepare and administer the medication. "Home-grown" kits were created to provide optimal cost-effective therapy, as this approach avoids the need for continued education on an additional delivery device that in itself presents the confounder of mis-fire.

How was this solution implemented?
Multiple committees (Code Blue, Pharmacy & Therapeutics, Emergency Department, Medical Executive, and Nurse Practice Council) reviewed and endorsed the process developed by the multidisciplinary work group. On the spot training was performed at the time of code carts modification. Change of shift huddles disseminated the information further. Annual nursing anaphylaxis education occurs in combination with cardiopulmonary resuscitation assessment.

Measurable Outcomes.
Since roll-out of the project in July 2010, three patients have received epinephrine for suspected anaphylaxis in the emergency department. All patients received the correct dose of epinephrine via the correct route. None of the patients experienced any additional medication-related adverse event secondary to epinephrine administration.

Sustainability.
Annual education reinforces the patient safety initiative. In addition, all medication-related adverse events are evaluated, reviewed, assembled and reported to the Pharmacy and Therapeutics Committee. The combination of persistent education and continuous surveillance should assist in sustained results.
Role of Collaboration and Leadership.

What role did teamwork and collaboration play in the solution?
Teamwork and collaboration were essential in creation and implementation of the solution – nursing, medicine, pharmacy and education and training (staff and department heads) all contributed. The solution would not have been realized without the input from all of the respective areas of expertise.

What partners and participants were involved?
Nurses, physicians, and pharmacists, staff members and department heads were all involved.

Was the organization’s leadership engaged and did they share the vision for success?
Absolutely! Nursing, pharmacy and medical leadership all recognized the potential risk, and supported a process change that resulted in improved patient care.

How was leadership support demonstrated?
Leadership support was demonstrated via actions by the institution’s Emergency Department Committee, Code Blue Committee, Nurse Practice Council, the Pharmacy and Therapeutics Committee, and the Medical Executive Committee.

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ANAPHYLAXIS KIT

SQ or IM Administration ONLY
Do NOT use for cardiac arrest

Contents:
- Epinephrine 1:1000 (1 mg/mL) ampule
- Filter needle
- Syringe w/SQ needle
- Alcohol swab

Directions:
1. Determine dose
   a. Adult (30 kg or greater): **0.3 mg** (0.3 mL of 1:1000 epinephrine)
   b. Pediatric (15 – 30 kg): **0.15 mg** (0.15 mL of 1:1000 epinephrine)
   c. Pediatric (less than 15 kg): **0.01 mg/kg**
2. Remove (and retain) SQ needle from syringe
3. Attach filter needle to syringe
4. Break ampule
5. Withdraw approximate calculated dose of epinephrine
6. Remove filter needle
7. Attach SQ needle to syringe
8. Remove air bubbles from syringe and level plunger at the calculated dose (e.g. 0.3 mL for adults)
9. Administer SQ or IM

Expiration date: __________  Prepared by: __________  Checked by: __________
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