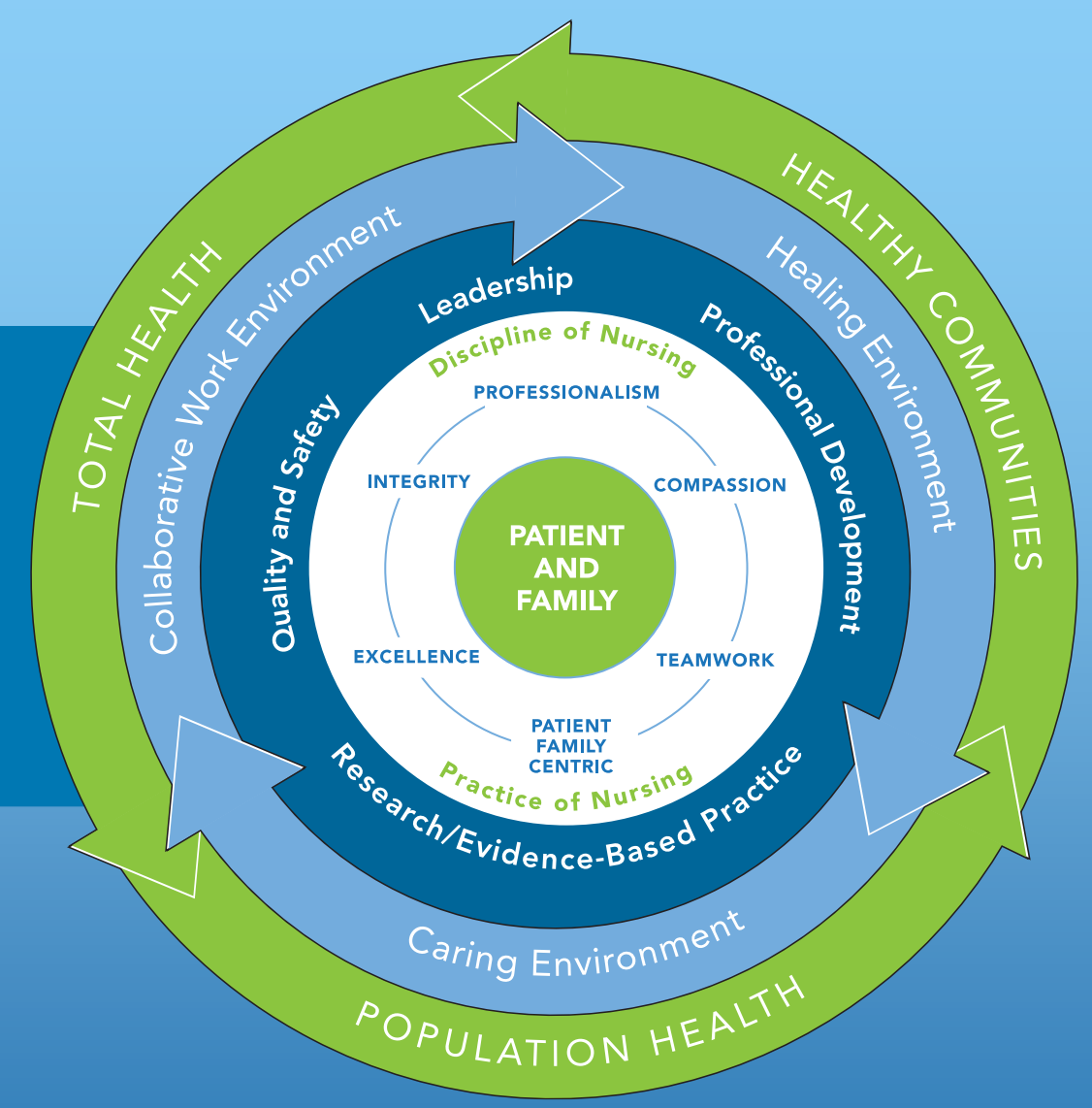


Improving Diabetes Ketoacidosis Management with 2-Bag System Protocol

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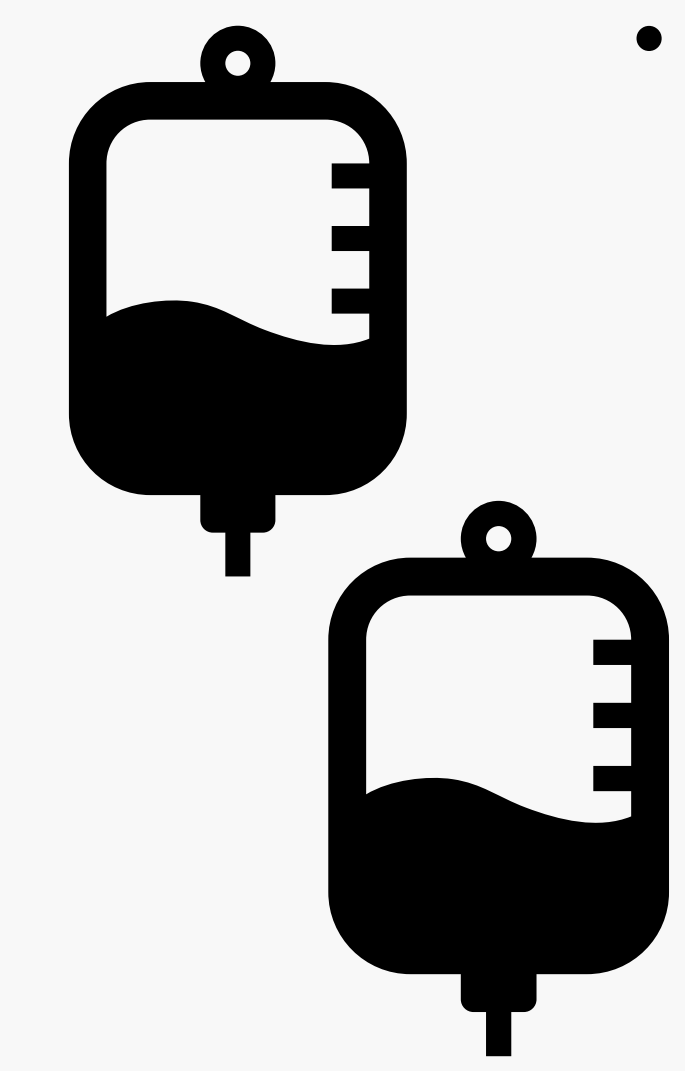
Culture of Excellence



INTRODUCTION

INTRODUCTION:

- Kaiser Permanente Panorama City (KPPC) has been using the standard DKA treatment using insulin, fluid resuscitation, and electrolytes replacement
- Following the lead of KP Riverside and region, KPPC adapted the 2-bag system for DKA treatment



- The 2-bag system entails aggressive fluid resuscitation using 2-bags of fluid at a time. The 1st bag of fluid is isotonic, and the 2nd bag has dextrose. Both fluids are adjusted in response to the patient's blood glucose level per protocol (Cho, 2021).
- The main difference between the 2-bag system with the traditional one-bag DKA treatment is that the fluids are the ones titrated while the insulin drip rate remains constant.
- Perceived benefits with the DKA 2-bag system protocol are as follows (Gosmanov, 2014 & Phillips, 2018)
 - Improved transition of care from ED to inpatient
 - Ease of DKA protocol application
 - Less time to close the anion gap
 - Decreased incidence of hypoglycemia

SITUATION:

- Due to the successful pilot, the decision was made to implement the use of DKA 2-bag system in all SCAL Medical Centers.

METHODS



- In-service training was provided to all ICU, DOU, and ED nurses
- Training comprised of both theoretical and practical aspects of DKA management
- The existing DKA worksheets were revised to reflect aspects of the DKA 2-bag system
- Nurses were given opportunity to use DKA worksheets using case studies
- Nurses learned the changes in insulin drip and IV fluid titration, electrolytes replacements, and new guidelines on DKA resolution
- Data about length of stay, anion gap closure, and hypoglycemia incidence pre and post implementation was gathered
- DKA patients encompass both DM type 1 and DM type 2

RESULTS

RESULTS:

- The DKA 2-bag system protocol was implemented July 2021.
- Post implementation data was consistent with the anticipated benefits when the 2-bag system was implemented:
 - Decreased in hospital length of stay
 - Earlier anion gap closure
 - Decreased incidence of hypoglycemia
- The DKA 2-bag system protocol strengthened the existing hospital-wide diabetes management initiatives.



Comparison of previous DKA protocol and after implementation of 2-bag system protocol

	Pre-Implementation Mar – Jun 2021 (n:58)	Post-Implementation Aug – Dec 2021 (n:65)
LOS	3.29	2.47
Anion gap closure (hrs)	13.56	10.94
Hypoglycemia events	3.4%	1.02%

- Clinical nurses reported simplified management of IVF and insulin drip titration

“The DKA 2-bag system is nurse friendly. It increases nurse autonomy and self-confidence because it is easier to follow”
-Elena Palacio, BSN, RN, CCRN, SCRN
ADA/Educator
ICU/DOU/Telemetry

IMPLICATIONS FOR PRACTICE

- The DKA 2-bag system protocol helps improve clinical outcomes.
- It simplified DKA management.
- The user-friendly tool developed by KPPC clinical nurses complemented the protocol and eased the transition of patients from ED to inpatient units.
- Ongoing audits are being done to sustain consistency in practice across continuum.

“Overall, the DKA 2-bag system is a success! Before, when there is a DKA patient coming from ED, the nurses will hide and pray that they will not get that patient. Now, everyone seems to be excited to take care of DKA pts. Its working, learning, and having fun plus feels great ‘hero-like’ when whoever closes the gap the quickest. We try to beat everyone’s record...the fastest will be the DKA King/Queen aka ‘the gap closer’”

-Raymond Basanes, BSN, RN, CCRN
DOU Relief Charge Nurse

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