



Painful Infusions of Potassium

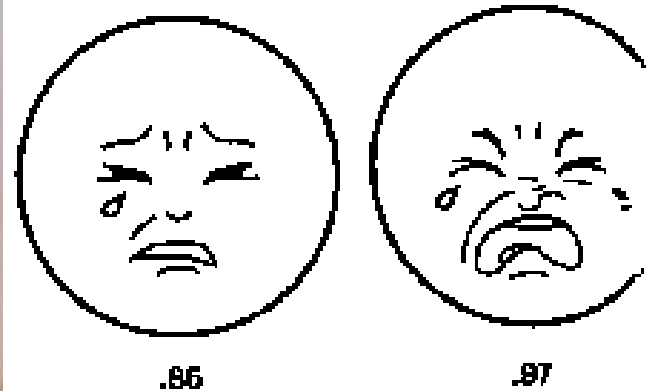
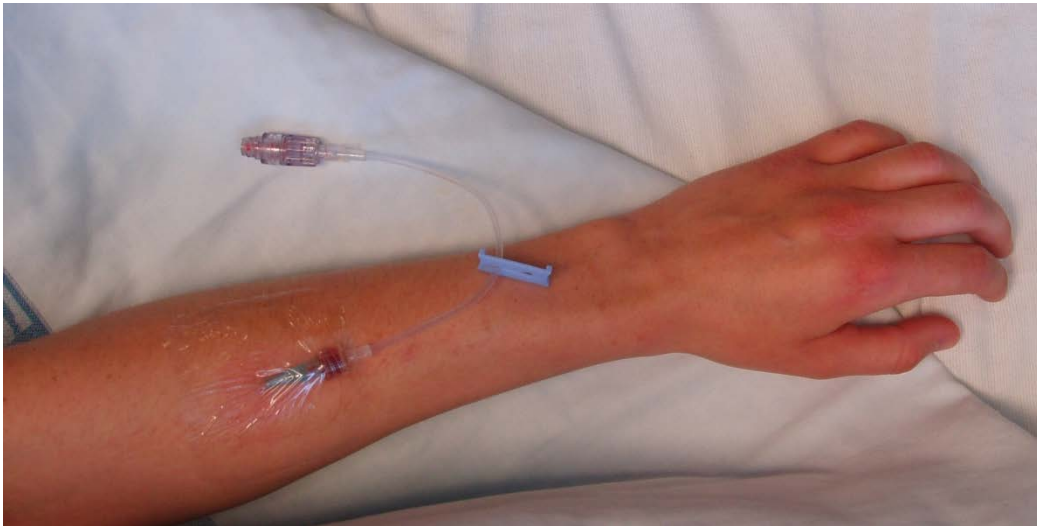
A Potassium Protocol

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NYSPANA State Conference

Objective

To identify strategies for intervention when the patient experiences pain during infusion of potassium.

Demonstrate the impact of relatively simple solutions on patient's pain.



Case Study

78 year old female c/o abdominal pain and nausea and vomiting x 1 week, presents in the operating room for a small bowel resection. She has a history of CHF, HTN, ↑cholesterol, CAD, A fib, diabetes on multiple medications including diuretics.

Postop she is slow to recover. Lab calls to report a critical value, K is 2.7. Nurse notifies the surgeon and an order is generated for potassium replacement.

Anticipated outcome

| Normal | Potential Problems |
|---|---|
| <ul style="list-style-type: none"><input type="checkbox"/> Recovery benchmarks<input type="checkbox"/> Fluid & electrolyte balance<input type="checkbox"/> Manage underlying conditions<input type="checkbox"/> Return to regular activity | <ul style="list-style-type: none"><input type="checkbox"/> Poor recovery<input type="checkbox"/> Exacerbation of primary conditions<input type="checkbox"/> Phlebitis<input type="checkbox"/> Vascular injury<input type="checkbox"/> Cellulitis<input type="checkbox"/> Increased LOS<input type="checkbox"/> Increased \$\$\$<input type="checkbox"/> Poor outcome |

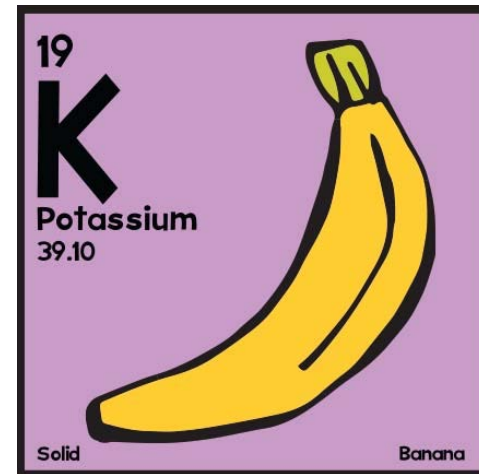
Role of Potassium

Hypokalemia:

- Most common cause- GI loss
- Diuretics- GU loss

Clinical Picture

- Muscle weakness/spasticity
- Lethargic
- Cardiac dysrhythmia
- Nausea and Vomiting
- Fluid Imbalance



Managing the pain from K+ IV infusion

Where do I start?

- Relieve the discomfort
- Get through the situation
- Handle the next case better
 - Consult colleagues
 - Find a best practice reference
 - Apply some critical thinking

Dealing with the frustration

- No guidelines or references
- No consensus on intervention
- Poor Patient/Family Satisfaction
- Risk of flagging for Med error

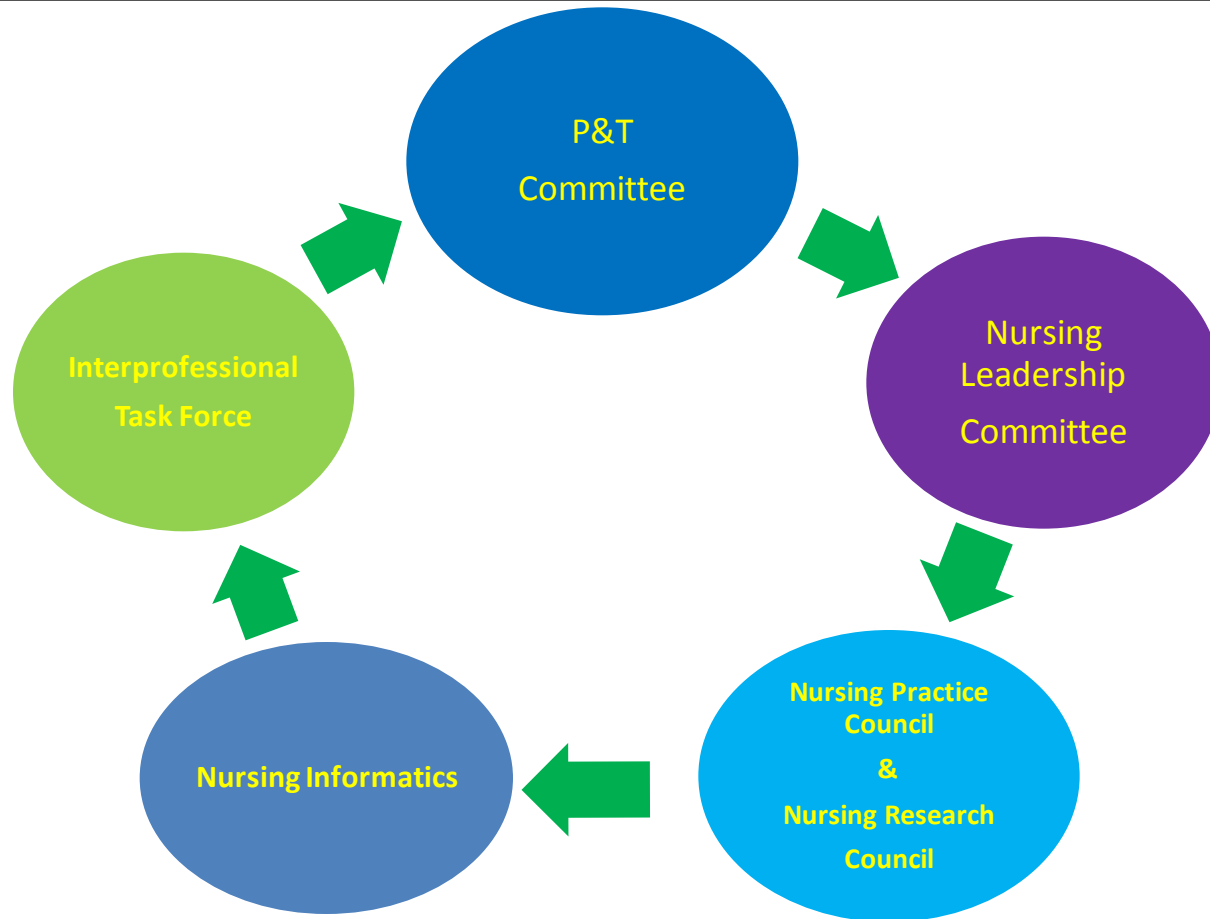
What to do next????



Journey begins

- Bring issue to Nursing Practice Council
- Solicit interprofessional perspective- Pharmacy & Therapeutic Committee
- Search the literature
- Explore current practices

Shared Governance



Organizational Resources

- Administrative awareness/leadership
- Interprofessional communication/input
- Nurse Practice Council
 - Evidence based practice
 - Policy and procedures
- Nursing education
 - Magnet resources
 - Practice integration

Magnet Resources

- Bedside Scholars program
- Clinical Scholar Mentoring Group
- Magnet Program Coordinator
- Academic Advisor



EBP Model: ACE Star

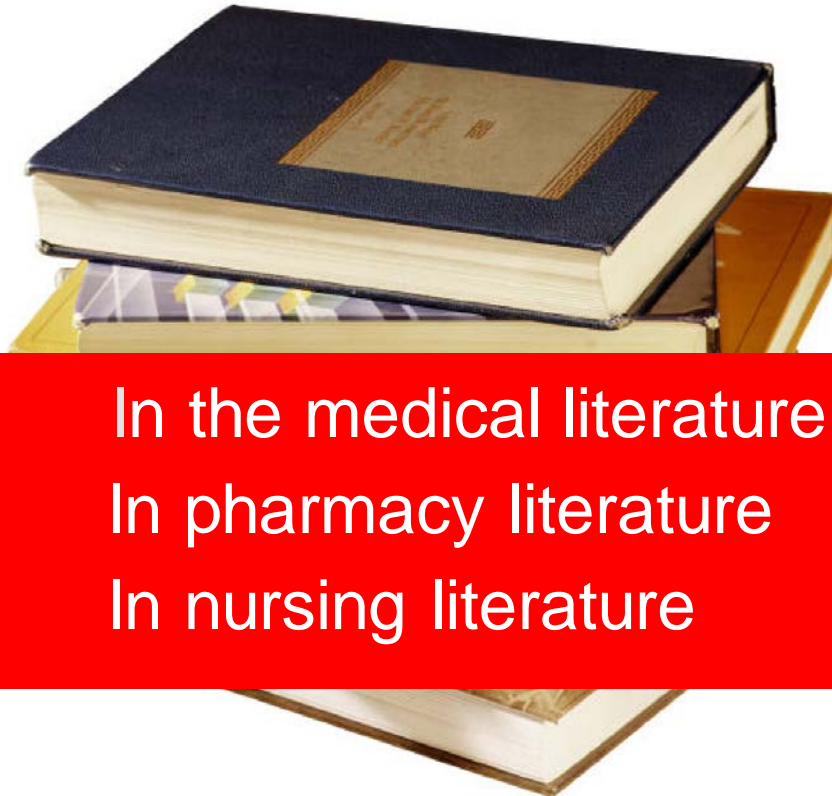


The Research Council uses the Academic Center for Evidence-based Practice (ACE) model of transforming knowledge into evidence-based practice.

PICO question

- P**roblem-Patients on K+ IV infusion unable to take oral K+ and refuse infusions due to complaint of pain
 - I**ntervention-Measure the prevalence of patient complaint/discomfort during K+ IV infusion and identify strategies that reduce pain
 - C**omparison-Compare strategies practiced by RNs
 - O**utcome-Establish a standard of care for pain management at the site of K+ IV infusion
-

No standard of care or best practice for pain management of potassium infusions



In the medical literature
In pharmacy literature
In nursing literature

Method-Data collection

- First 3 months (1st quarter):
 - Monitoring of Electronic
 - Health Record for
 - Adverse Drug Event

No events reported!



Survey design-a joint effort

Successful collaboration between
Pharmacy and Nursing:

- To identify KCL order
 - Fill order
 - Attach paper survey form
 - Retrieve form from units
 - Collate responses for analysis
-

Survey

UNIT _____ Date _____ Pt Fin # _____ age/dob _____

Survey on pain at site of **peripheral IV KCL infusion**

Please complete each time you give peripheral IV KCL infusion, either bolus or IV maintenance infusion

When patient develops pain* at the infusion site when administering KCL, what action did you take?

| | I tried this (put Yes or No) | Did this work |
|---------------------------|------------------------------|---------------|
| Application of Ice | | |
| Adjust rate | | |
| Elevate extremity | | |
| Topical oint | | |
| Pre-medicate (ie Tylenol) | | |
| OTHER (identify) _____ | | |

| Angio size | Site location | Maintenance drip | KCL bolus |
|------------|---------------|------------------|-----------|
| | | | |
| | | | |
| | | | |

Pain scale (1-10) _____ (how much pain does the patient report at IV site or along IV route?)

Please indicate the strategy that you have found most successful in relieving patient pain and discomfort:

Name _____ Unit _____

Methods-Data collection

Second 3 month
(2nd quarter):

Monitoring by use
of paper survey
attached to K+IV
infusion delivered
to nursing unit



- Large increase in response rate!

Results

After 3 months of data collection (SURVEY N=90)

Analysis of Data reported infusion site pain was decreased by the following:

- K+ IV infusion rate lowered—52 %
- Ice pack application—17 %
- Extremity elevation—16 %
- Pre-medicate/other—4 %

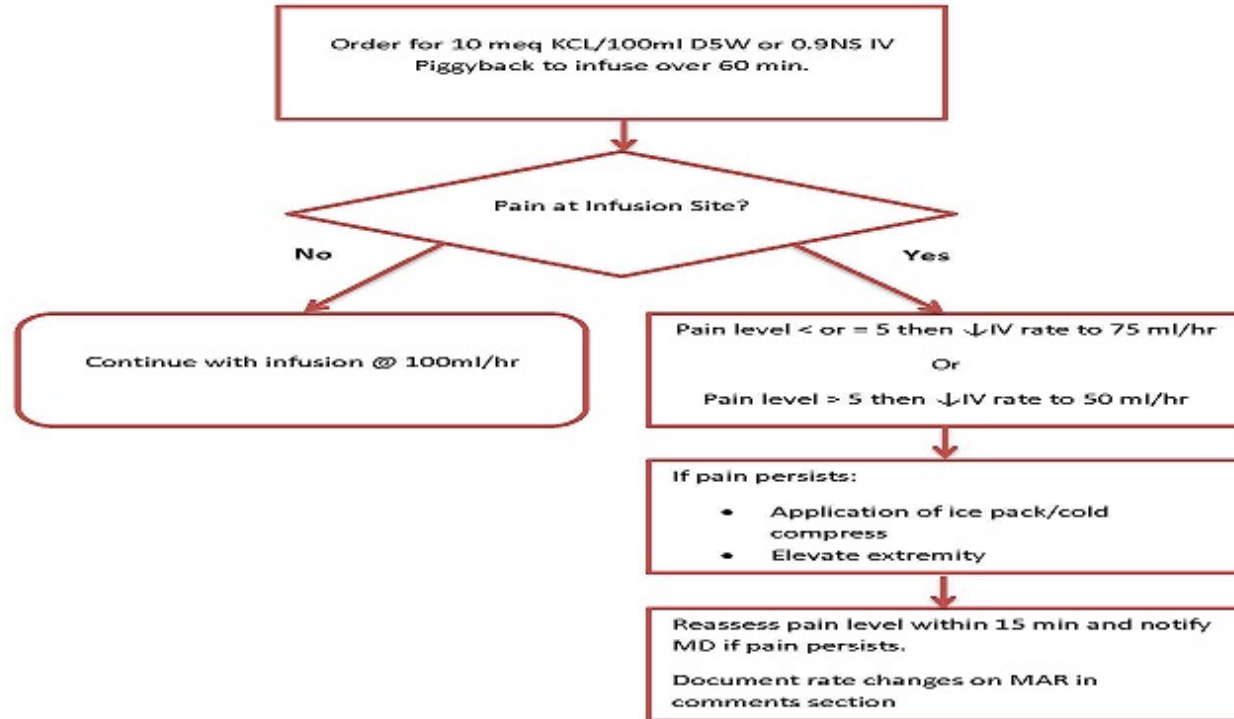
Question????

Have you tried any of these interventions?

What about warm remedies as opposed to cold?

IV Potassium Protocol

NewYork-Presbyterian Hudson Valley Hospital IV Potassium Protocol



References:

Chen, R. & Armstrong, D. (2004). Peripheral intravenous infusion of potassium chloride: Effect of solution composition on infusion-site pain. *Journal of Hospital Pharmacy*, 57(1), 27-31.

DeGuzman, Z. C. et al. (2012). Bacteriostatic normal saline compared with buffered 1% lidocaine when injected intradermally as a local anesthetic to reduce pain during intravenous catheter insertion. *Journal of PeriAnesthesia Nursing*, 27(6).

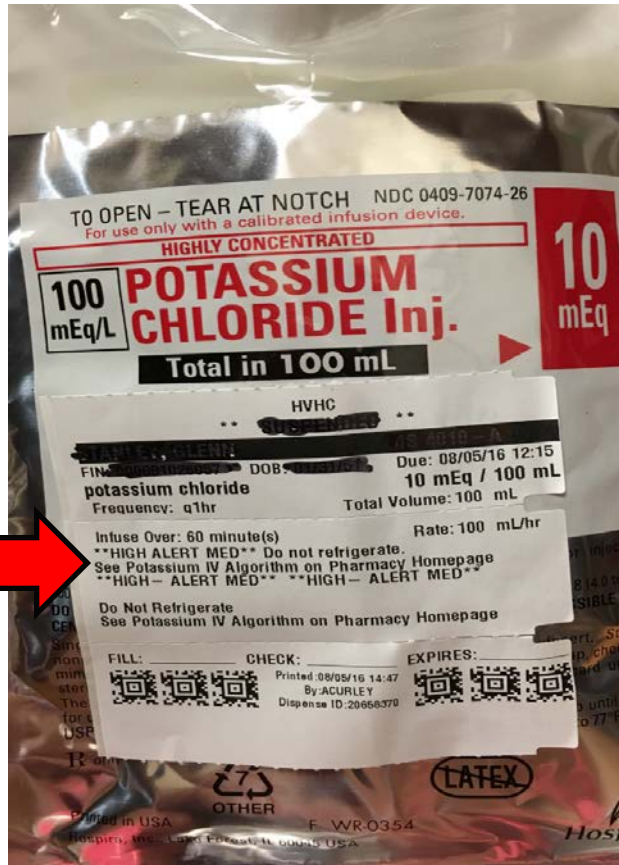
Grisinger, M. (2005). Adding lidocaine to IV potassium infusions can cause safety problems. *Pharmacy & Therapeutics*, 33(2), 70-75.

09/2017 EDUMMA/ED

Steps in EBP process

- ✓ Analyze the data
- ✓ Present evidence to committees
- ✓ Translate the evidence into development of a protocol
- ❑ Integrate the protocol into practice
- ❑ Evaluate the effectiveness of the protocol

Labeling IV Potassium Dose



Nursing- Pharmacy collaboration

Follow-up Survey

Attach Patient Label


Follow up Peripheral IV KCL Infusion Survey

Survey on Pain at site and Use of Peripheral IV KCL Infusion Algorithm

Please complete each time you give **peripheral IV KCL** infusion, either bolus or IV maintenance infusion

When patient develops pain* at the infusion site when administering KCL what action did you take:

| Treatment | Check which intervention was used | Check which intervention was effective |
|--|-----------------------------------|--|
| Application of cool compress | | |
| Application of warm compress | | |
| Adjust rate | | |
| Elevate Extremity | | |
| Pain Medication administered? Name _____ | | |
| Did you use the algorithm found on Pharmacy Homepage | | |

 PAIN AT INFUSION SITE (**prior** to intervention): Pain Scale (1-10) _____

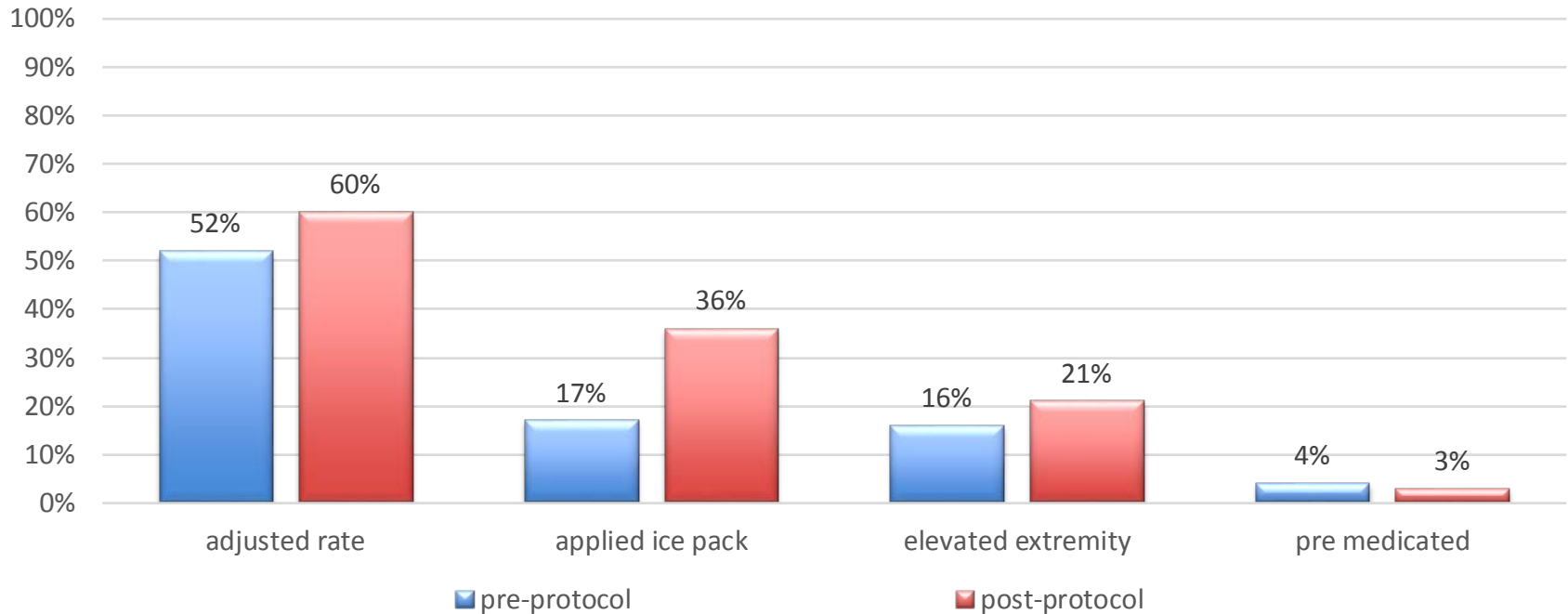
PAIN AT INFUSION SITE (**post** intervention): Pain Scale (1-10) _____

8/2017EH/MMA

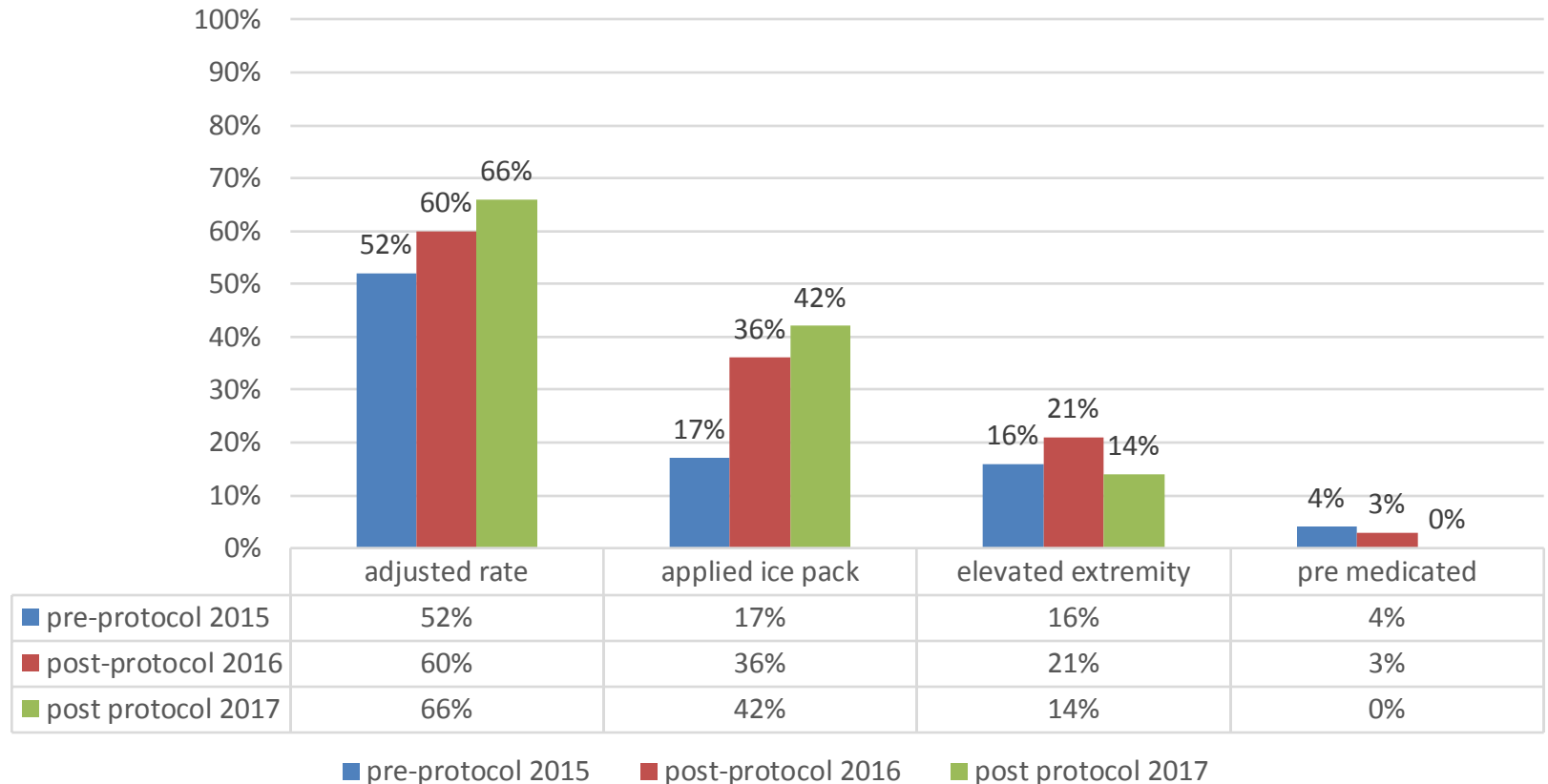
RETURN COMPLETED FORM TO PHARMACY (via pneumatic tube)

Nursing Interventions for pain related to Infusion of IV Potassium

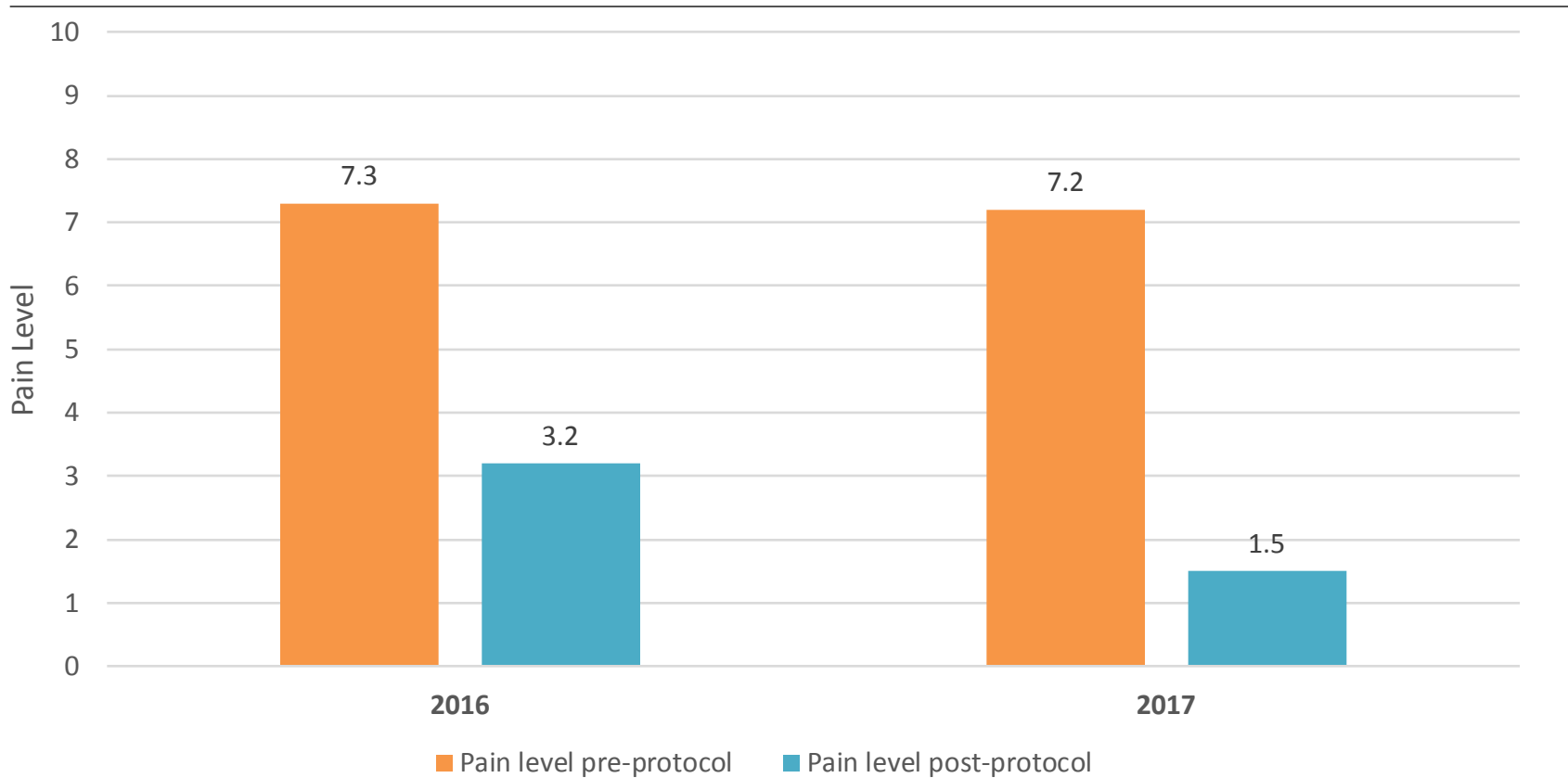
Interventions for pain relief related to IV Potassium Infusion



Nursing Interventions for Pain Related to Infusion of IV Potassium



Average Reported Pain Level related to IV Potassium Infusion



Lessons Learned

- ❖ Bedside nurse participation
- ❖ Interprofessional collaboration
- ❖ Research that involves surveys and questionnaires depends on response rate
 - Missing data
 - Cause of not getting forms returned.
- ❖ Academic support

Question?????

Does the pain during infusion of potassium mean the venous system could be harmed??

Are we possibly masking phlebitis??

Future areas for research

- Multi-site validation through a research study
- Explore clinical items not included in this project
 - Warm compress was not tested.
 - Were there clinical signs and symptoms associated with low K level.
 - How many orders were D/C'd as the only action taken

Is there a risk of phlebitis with each infusion?

Summary

- Documented resource
- Modify order entry
- Nurse-Patient relationship
- Improve patient outcomes

“I think one's feelings waste themselves in words; they ought all to be distilled into actions which bring results.”



FLORENCE NIGHTINGALE

References

- ❑ Chan, R. & Armstrong, D. (2004). Peripheral intravenous infusion of potassium chloride: Effect of solution composition on infusion-site pain. *Journal of Hospital Pharmacology*, 57(1), 27-31.
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- ❑ Grissinger, M. (2008). Adding lidocaine to IV potassium infusions can cause safety problems. *Pharmacy & Therapeutics*, 33(2), 70-75.
- ❑ Gorski, L., et al., (2016), Infusion Therapy Standards of Practice. *Journal of Infusion Nursing*, 39(1S).

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- ❑ Liam, E.T., Kloo, S.T., Tweed, W.A. Efficacy of lignocaine in Alleviating potassium chloride pain. *Anesthesia and Intensive Care*, 20 (2):196-198.
- ❑ Melnyk, B.M., Fineout-Overholt, E., Gallagher-Ford, L., Stillwell, S.B.. Sustaining Evidence-Based practice through Organizational Policies and an Innovative Model. *AJN*, Sept. 2011, Vol. 111, No 9, 57-60.
- ❑ Gorski, L.A., Hagle, M.E., Birman, S. Intermittently Delivered IV Medication and pH: Reevaluating the evidence. *Journal of Infusion Nursing*, Jan-Feb 2015, Vol. 38, No 1, 27-46.

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