How to best implement a new burn resuscitation strategy in the nurse team ?

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Background and objectives

Having observed that fluid resuscitation was not systematically carried out with feedback loops in case of insufficient or too important fluid administration, the medical team proposed a new resuscitation strategy adapted to patients with 20-50% or to patients >50% BSA burns.

The aim was to delegate a part of the protocol to the nurses. As written, the physicians' algorithm was not understood by the nurses. The implementation process aimed to integrate the nurses.

Methods

Nurse meetings with the physicians to understand and analyze what is scary or problematic for nurses. Identification of types of goals that would be acceptable to the nurses mainly urine output and mean arterial pressure (MAP). Detailing the volume rate calculations and generating an Excel[®] file with integrated equations providing guidance to increases or decreases of hourly fluid resuscitation volumes by +/- 25%. As well as defining cut-offs of urine output, MAP, SvO₂, and Lactate that would generate calling the physician. Then the procedure was tested on simulated cases, and thereafter on 3 consecutive patients.

Example of using the automatic calculation table			
Weight	75		
% BSA	<20%	Half Parkland 20-50%	Parkland >50% or electrification
		40	
Total estimated volume of fluid resuscitation			6000 ml
Volume already received (prehosp, emergency, shower)			1000 ml
Initial flow rate : 250 ml/h			
Flow rate to be adjusted in ml/h according to diuresis and under and over resuscitation criteria			
If urine output > 1 ml/kg/h			
	current rate	that is	new flow rate
Reduce the flow rate by 25%.			0 ml/h
If urine output between 0.5- 1 ml/kg/h over 2 hours			
	current rate	that is	new flow rate
Reduce the flow rate by 25%.	250		188 ml/h
If liquid under-resuscitation criteria			
	current rate	that is	new flow rate
Increase flow rate by 25%.			0 ml/h

The nurse fills in the colored boxes and then the desired calculations are performed

Results and discussion

The equation guided fluid handling was functional and efficient. Over resuscitation was avoided in 3 patients (mean: Age 46y, TBSA 36%), total volume remained lower the theoretical Parkland volume. The number of fluid adaptations varied between 3 and 6 times in 24 hours.

The new handling surprised the physicians; nurses and physicians felt a little unsecure about this new procedure. But with support and guidance, they were surprised by the responsiveness and response of the procedure. A limit is when initial rhabdomyolysis is done after electrocution, urine output and lactate cannot be taken into account. Another challenge is to determine the volume to administer the next 24 hours but in our experience it is 30-40% below the total of first 24 hours.

Identifying and analyzing the problem

Create appropriate and functional tools

Inform and support the team

Patient-adapted resuscitation

Conclusion

While the nurses felt empowered by the new protocol, they felt stressed by this new responsibility. But with the right tools and information, resuscitation was efficient reducing the number of additional fillings administered. And more adapted to the real needs of the patient, regardless of the initial estimate.