



Districts IV & VII: 2022 Annual District Meeting
Together in Wellness: Reflect, Recharge, Reengage



ACOG

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Obstetricians and Gynecologists

A NOVEL RAPID FLUID INFUSION DEVICE FOR PATIENTS EXPERIENCING SEVERE OBSTETRIC HEMORRHAGE

Lisa Wanda | October 2, 2022



OUTLINE

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- Objectives
- Methods
- Results
- Conclusions
- Reference
- Disclosures



BACKGROUND

Background

- 84% of pregnancy-related deaths are preventable⁴
- 13.7% of pregnancy-related deaths were from hemorrhage⁴
- Obstetric hemorrhage requires quick recognition & rapid intervention to prevent morbidity & death



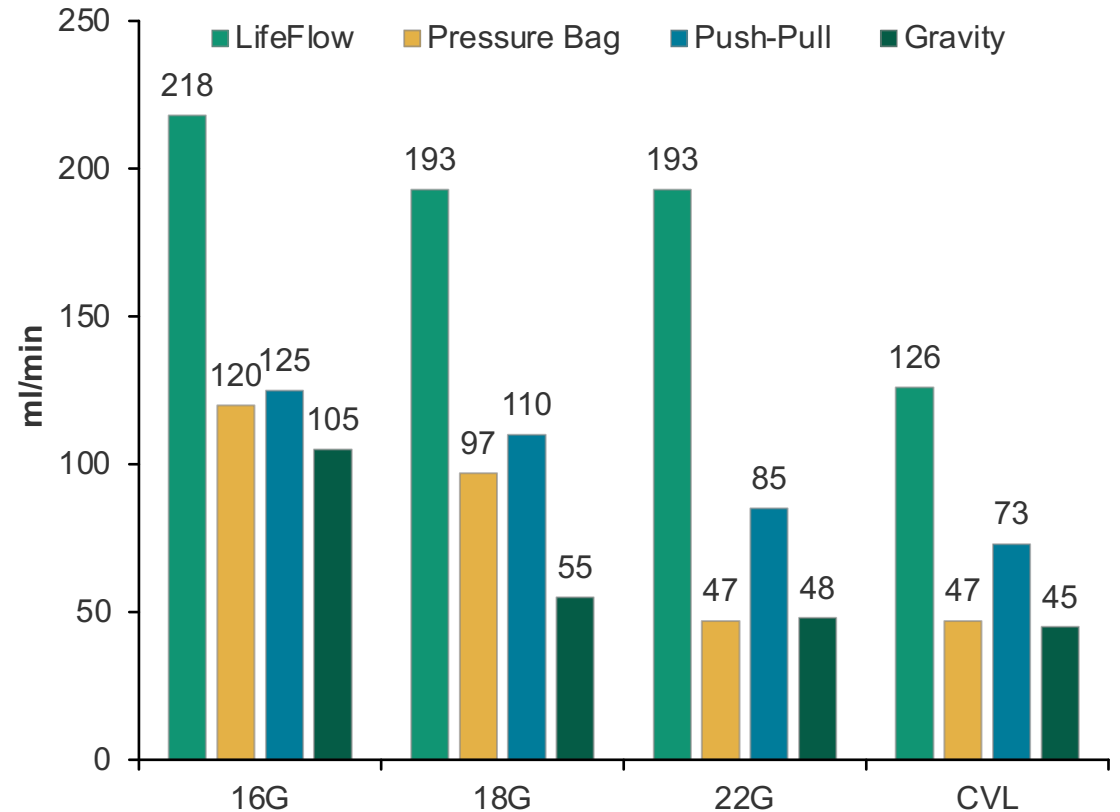
"No pregnant person should be passing away from a hemorrhage. We have the tools in the United States and we know how to deal with it. That was really disheartening to see."⁵

Dr. Andrea Jackson

BACKGROUND

- Rapid intervention with fluids, blood products and source control can help prevent progression of hemorrhage & hypovolemic shock.
- A manual rapid fluid infuser (RFI), LifeFlow[®], was designed to provide more rapid fluid delivery of crystalloid & blood products for patients with shock, approximately 4x faster than traditional methods (Fig. 1)
- Shock index (SI = HR ÷ SBP) performs well as a screening tool to predict adverse maternal outcomes for obstetric hemorrhage.¹⁻³
- Improvement in SI may serve as a marker of the effectiveness of early resuscitation

Fig 1. Comparing infusion rates of crystalloid using various fluid delivery systems



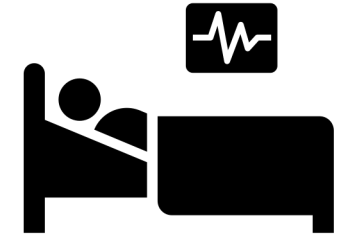
OBJECTIVE

OBJECTIVE

To describe the use of a novel RFI for rapid resuscitation of patients with obstetric-related hemorrhage presenting to a large urban-suburban health care system

METHODS

METHODS



Retrospective cohort of all patients from Jan 2017 - April 2022

Obstetric hemorrhage and received fluid/blood through the RFI

- PPH
- Ectopic pregnancy
- Spontaneous abortion

Urban-suburban health care system with 7 ED's, annual census 260,000, pop. 1.4 million

METHODS

IRB approval was obtained prior to any data collection

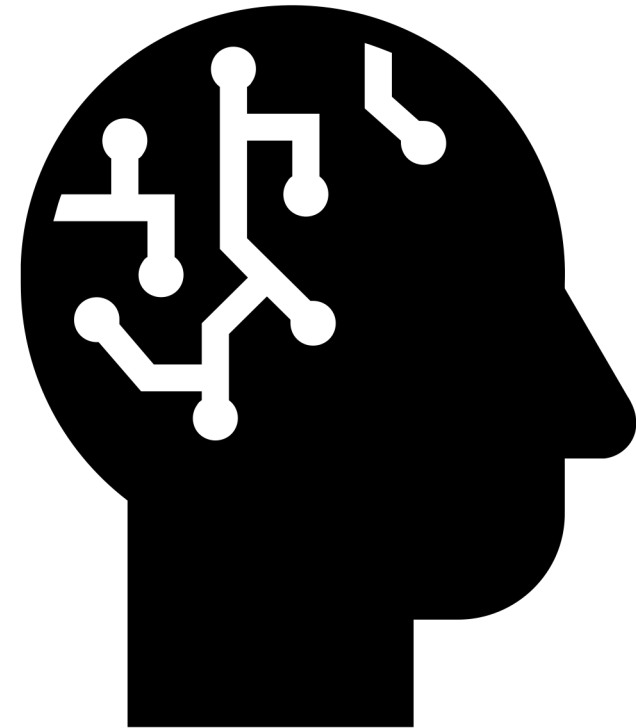
Demographic, clinical, outcomes data from SQL query of Epic EHR

Data were validated, transformed and analyzed using SAS, version 9.4 (Cary, NC)

Descriptive analysis with frequencies, proportions, medians with IQR

Wilcoxon Signed Ranks test for within-patient comparisons of pre- and immediate post-RFI vital signs

Primary outcome: Shock index



RESULTS

Table 1. Characteristics of patients with obstetric-related hemorrhage receiving fluid and/or blood via RFI

Variable	N=28
Median age (IQR), years	36.0 (28.1, 37.9)
Race (%)	
White	11 (39.3)
Black	10 (35.7)
Other	7 (25.00)
Diagnosis (%)	
Postpartum hemorrhage	5 (17.9)
Ectopic pregnancy	10 (35.7)
Spontaneous abortion	13 (46.4)
ESI level at triage (%); n=26	
ESI I	2 (7.7)
ESI I & II	15 (57.7)

Table 1. Characteristics of patients with obstetric-related hemorrhage receiving fluid and/or blood via RFI

Variable	N=28
Interventions (%)	
Received blood transfusion	16 (57.1)
Total blood products \geq 4 IU; n=16	11 (68.8)
Uterotonics	9 (32.1)
Any procedure	15 (53.0)
Laparoscopic treatment of ectopic	7 (25.0)
D & C	2 (7.1)
Hysterectomy	1 (3.6)
Surgical treatment for abortion	5 (17.9)

Table 1. Characteristics of patients with obstetric-related hemorrhage receiving fluid and/or blood via RFI

Variable	N=28
Worst SI Before RFI (%); n=25	
SI > 0.9	16 (64.0)
SI 0.9-1.69	13 (52.0)
SI ≥ 1.7	3 (12.0)
First SI After RFI (%); n=25	
SI > 0.9	10 (35.7)
SI 0.9-1.69	10 (35.7)
SI ≥ 1.7	0 (0.0)
Unadjusted outcomes	
Median hospital LOS, days	0.59 (0.37, 1.01)
Median ICU LOS, days; n=4	0.71 (0.57, 2.08)
ICU admission (%)	4 (14.3)
In-hospital mortality (%)	0

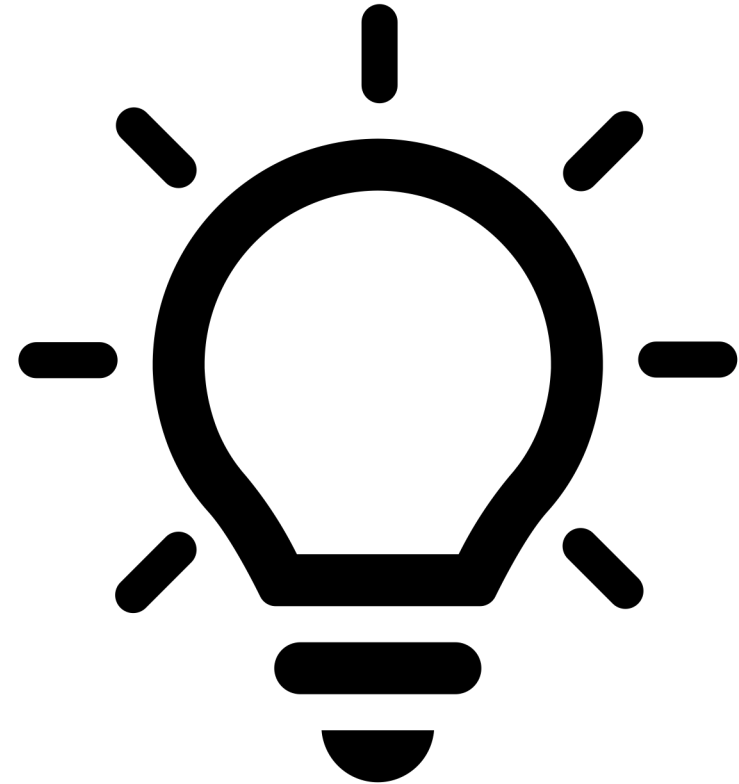
Table 2. Within patient comparison of vital signs before and after delivery of fluids and/or blood products via RFI

Vital Signs	Before RFI (IQR)	After RFI (IQR)	Median difference (IQR)	P-value
SBP, mmHg	90.0 (69.0, 106.0)	109.5 (89.5, 119.0)	-21.0 (-37.0, -5.0)	0.001
Heart Rate	109.0 (82.0, 120.0)	88.0 (73.5, 112.0)	10.0 (0.0, 32.0)	0.001
Shock Index	0.98 (0.79, 1.37)	0.78 (0.71, 1.03)	0.22 (0.02, 0.53)	0.001
MAP, mmHg	60.0 (46.7, 74.7)	76.3 (67.2, 85.8)	-13.7 (-23.3, -5.7)	0.001

CONCLUSIONS

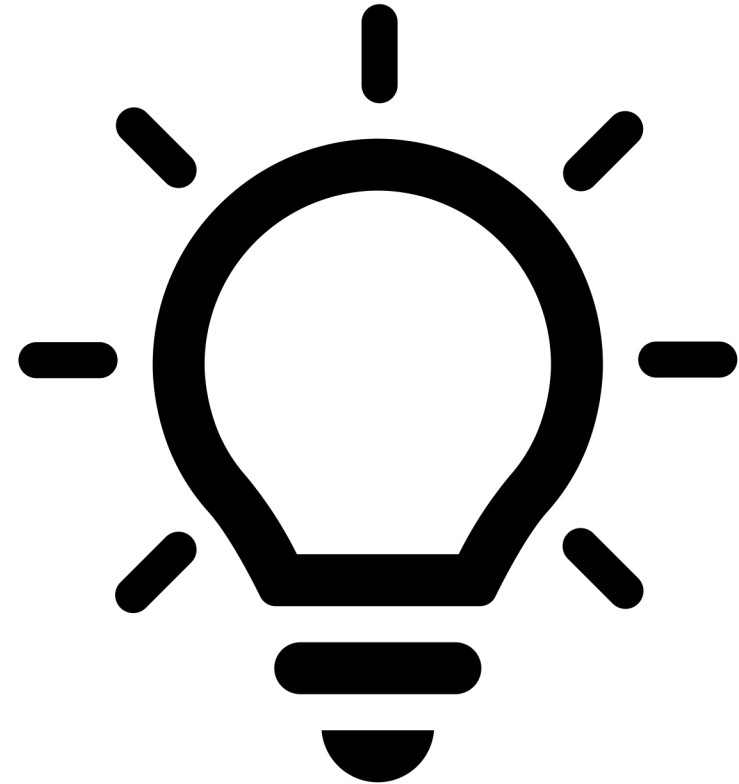
CONCLUSIONS

- Patients with severe obstetric hemorrhage, whose resuscitation included use of the RFI, experienced immediate improvement in SBP and SI
- This device may offer an additional tool in the rapid response to obstetric-related hemorrhagic shock while arranging for definitive intervention

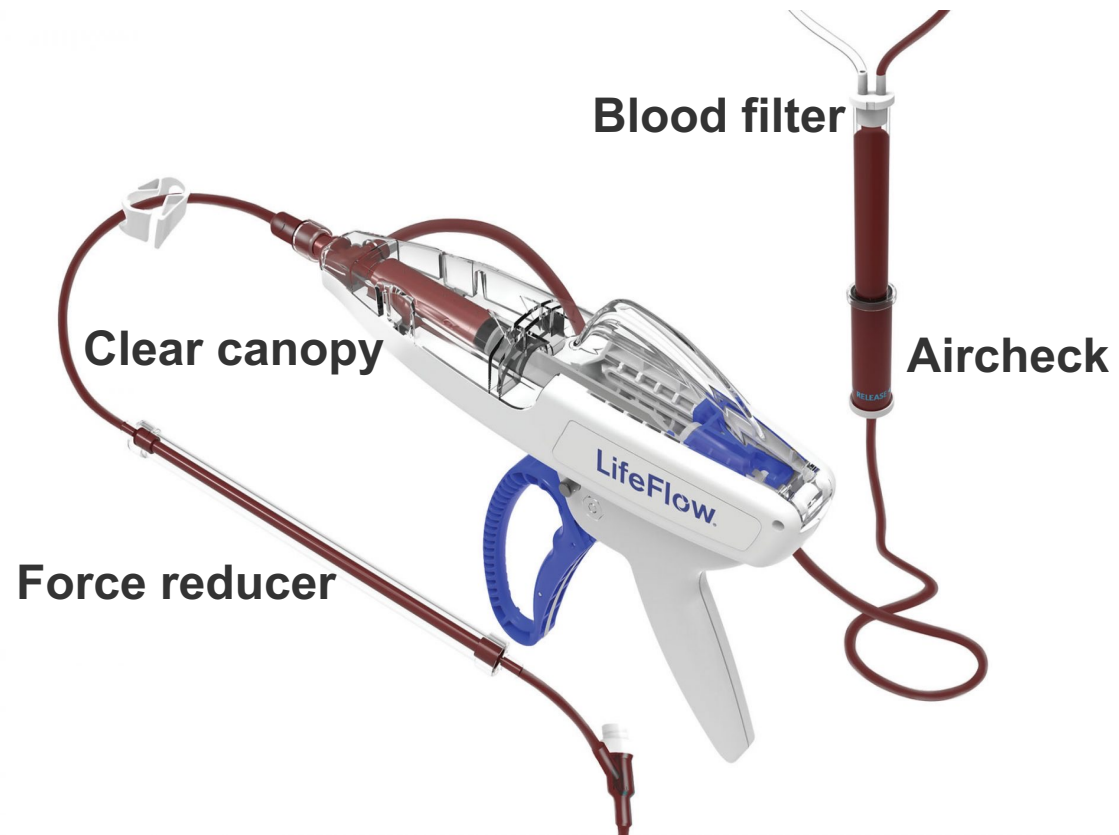


CONCLUSIONS

- The study findings are limited to descriptive analysis and within-patient comparison
- Controlled studies are needed to compare RFI to standard methods to determine the impact on patient outcomes



LifeFlow PLUS



REFERENCES

REFERENCES

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DISCLOSURE

DISCLOSURES

CONTRIBUTING AUTHORS

- Lisa C. Wanda MPH^{1,2}
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- Mark Piehl MD, MPH³

DISCLOSURE

- Mark Piehl is Co-Founder and Chief Medical Officer, 410 Medical
- Valerie De Maio is Senior Scientist, 410 Medical
- WakeMed Health & Hospitals is a shareholder in 410 Medical

