COMPUTER DECISION SUPPORT IN BURN RESUSCITATION

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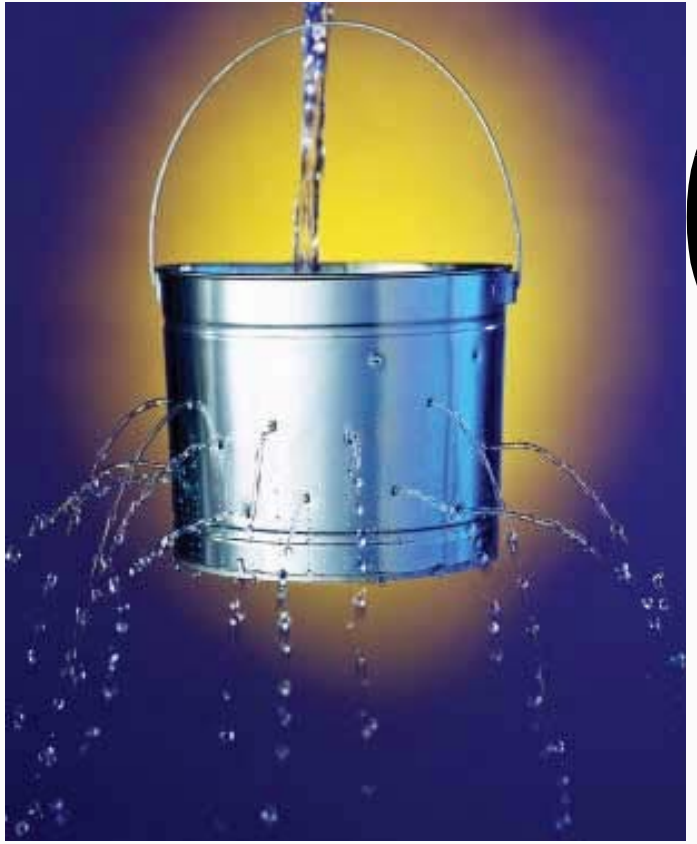
DISCLOSURES

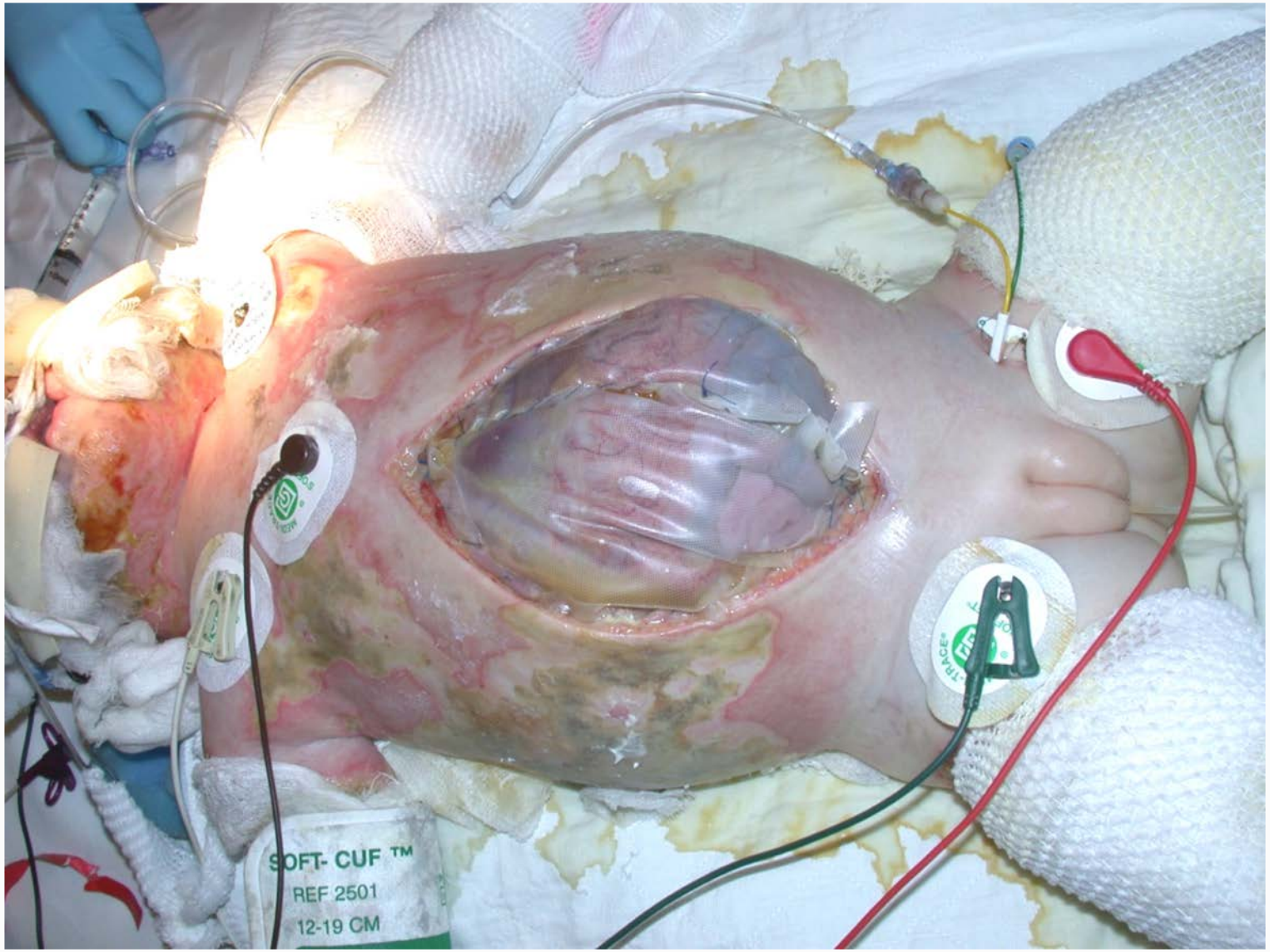
- Nothing to disclose

Previous Photo: Aaron Brethorst

BURN RESUSCITATION

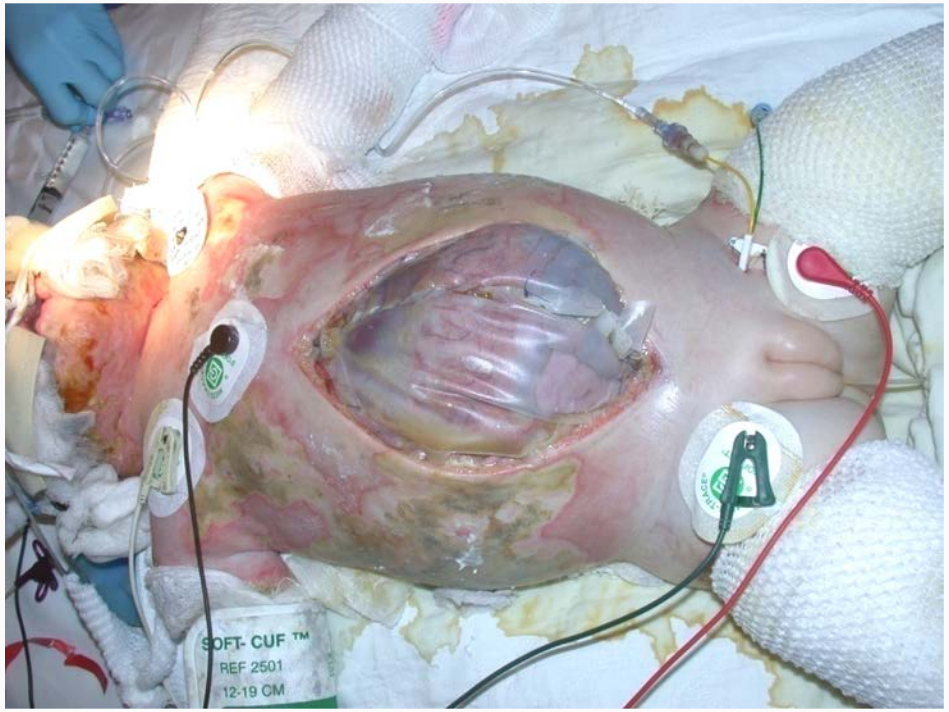


OVER-PREDICTED RESUSCITATION: A COMMON PROBLEM



CHILDREN AND ADULTS WITH <10% TBSA BURN OFTEN GET FLUID RESUSCITATION

- Can result from over estimation of burn
- But happens up to 40% of the time when prehospital TBSA = Burn Center TBSA

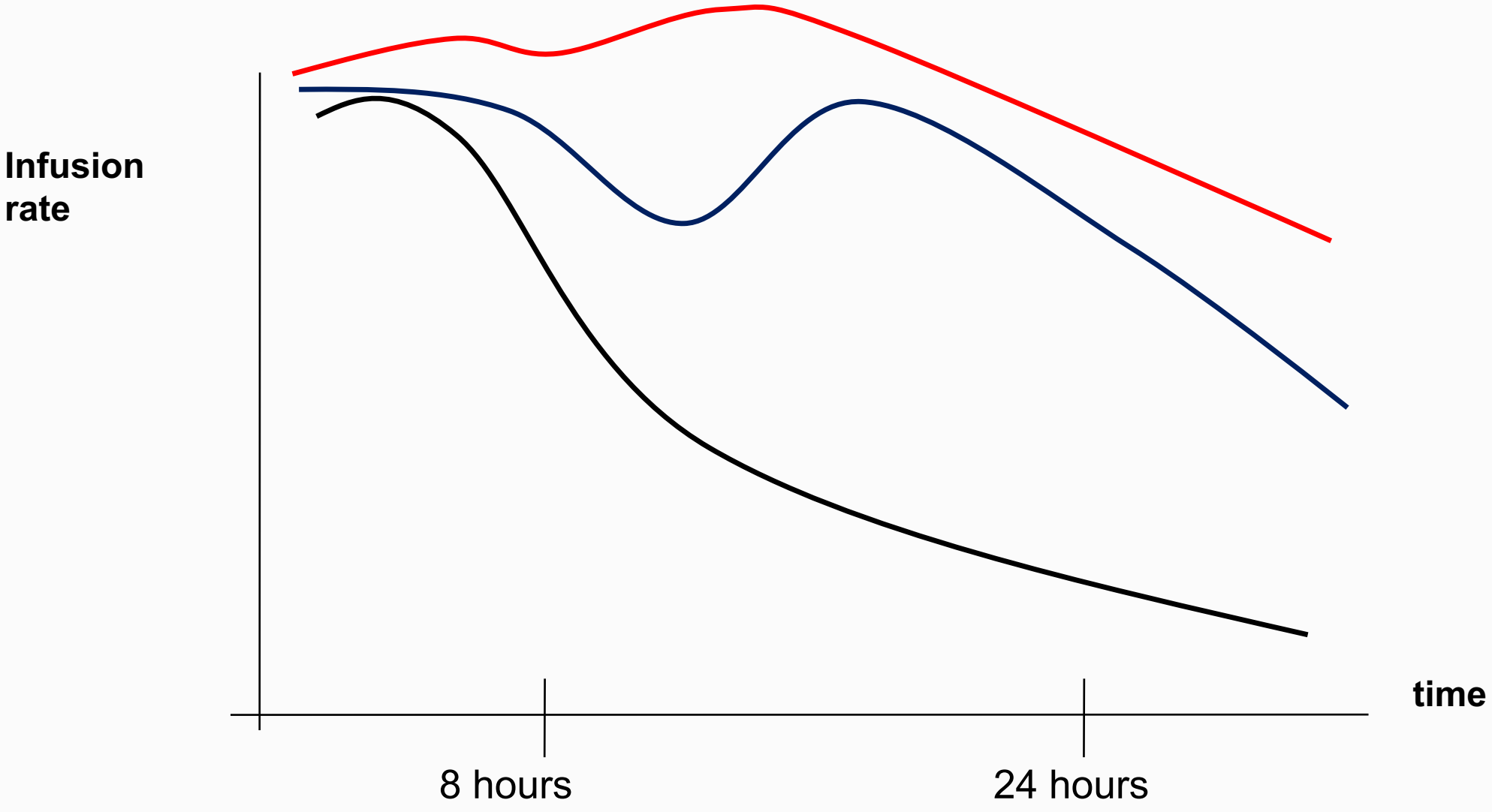


AT HARBORVIEW…

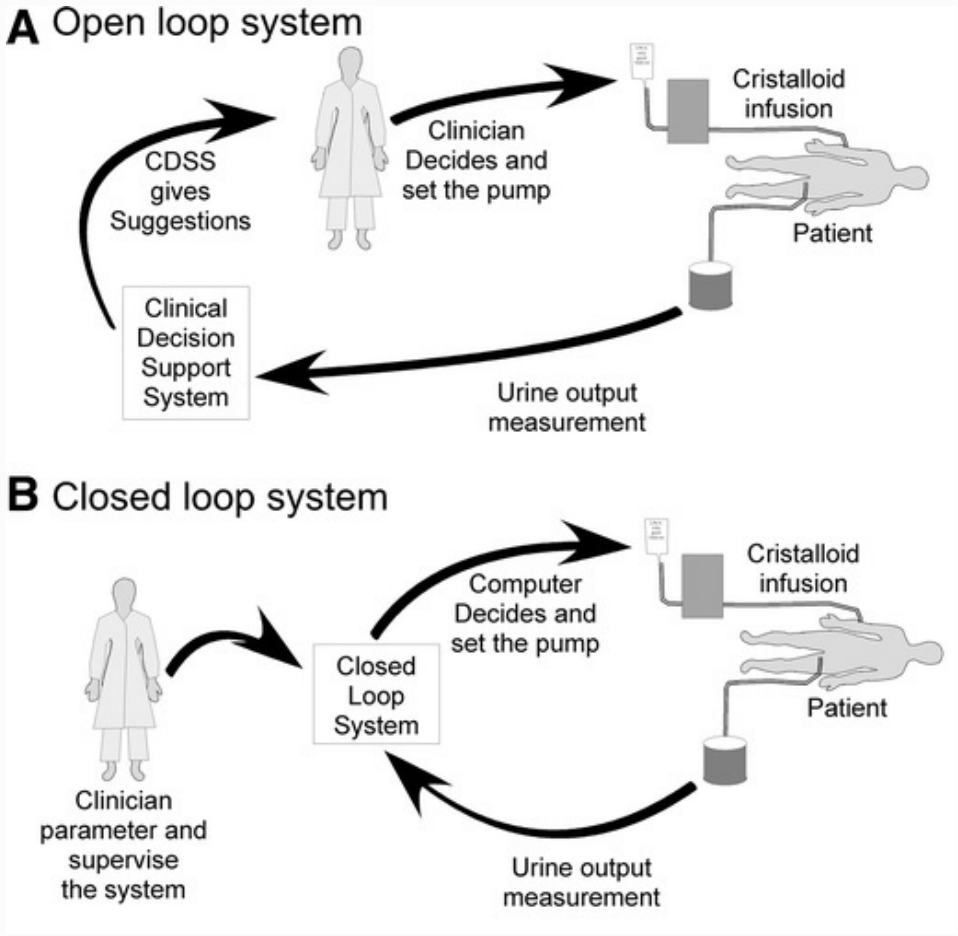
	Group 1	Group 2	P
Total fluids, first 24 h (cm^3/kg/%TBSA)	3.6 ± 1.1	8.0 ± 2.5	<0.01
Total fluids, first 24 h (cm^3)	15600 ± 7433	27367 ± 10064	<0.05
Range	7000–32000	10647–46850	
Urine output, first 24 h (cm^3)	1857 ± 1475	1730 ± 841	
Range	427–4160	759–3258	
Urine output, first 24 h (cm^3/kg/h)	0.9 ± 0.6	1.1 ± 0.6	

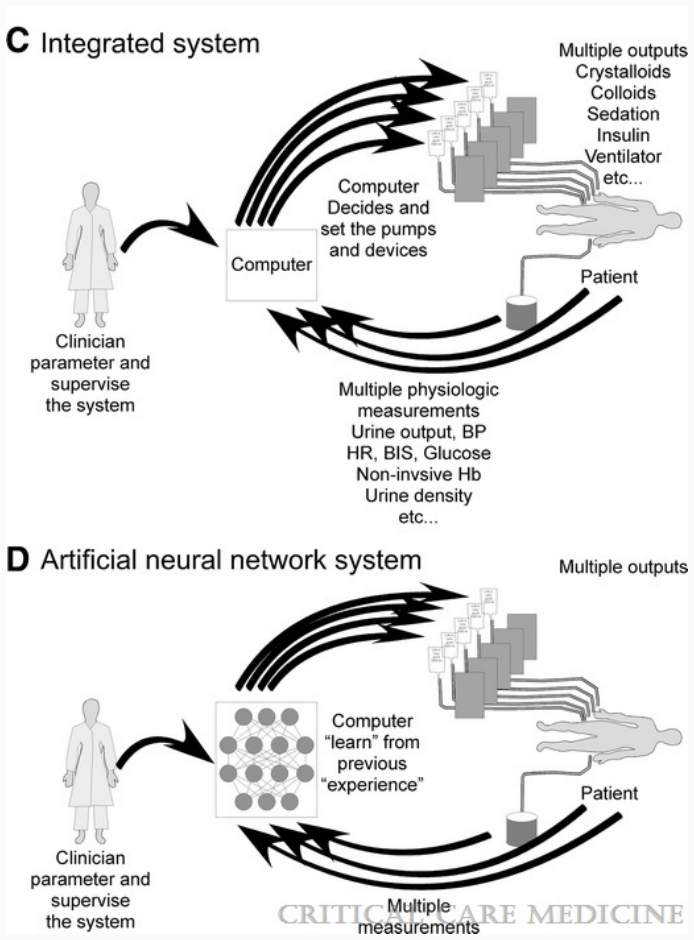
Friedrich et al. Burns 30 (2004) 464–466

TYPICAL RESUSCITATION CURVES



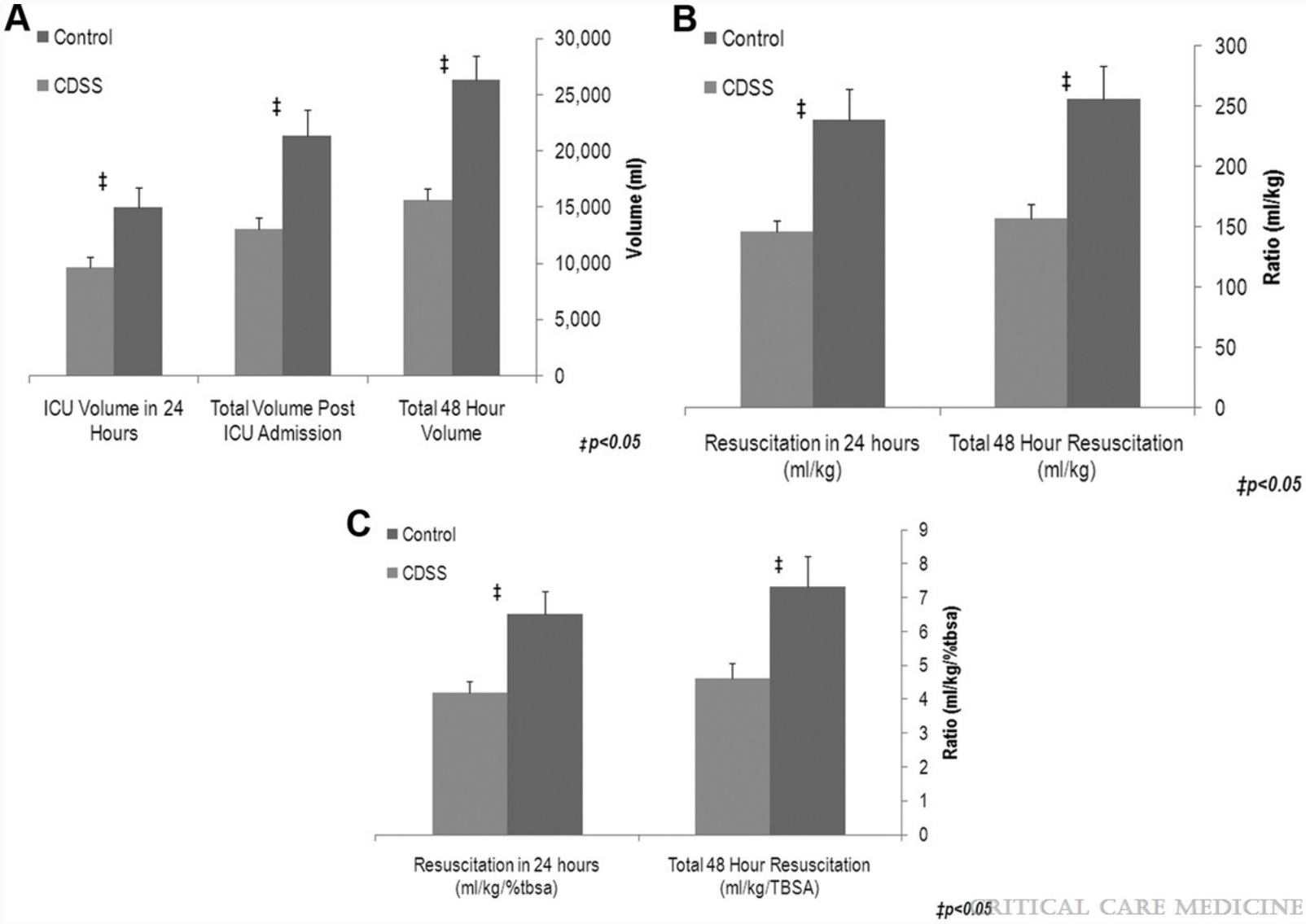
RESUSCITATION AUTOPILOT





Bracco D, CCM 2011

BURN NAVIGATOR

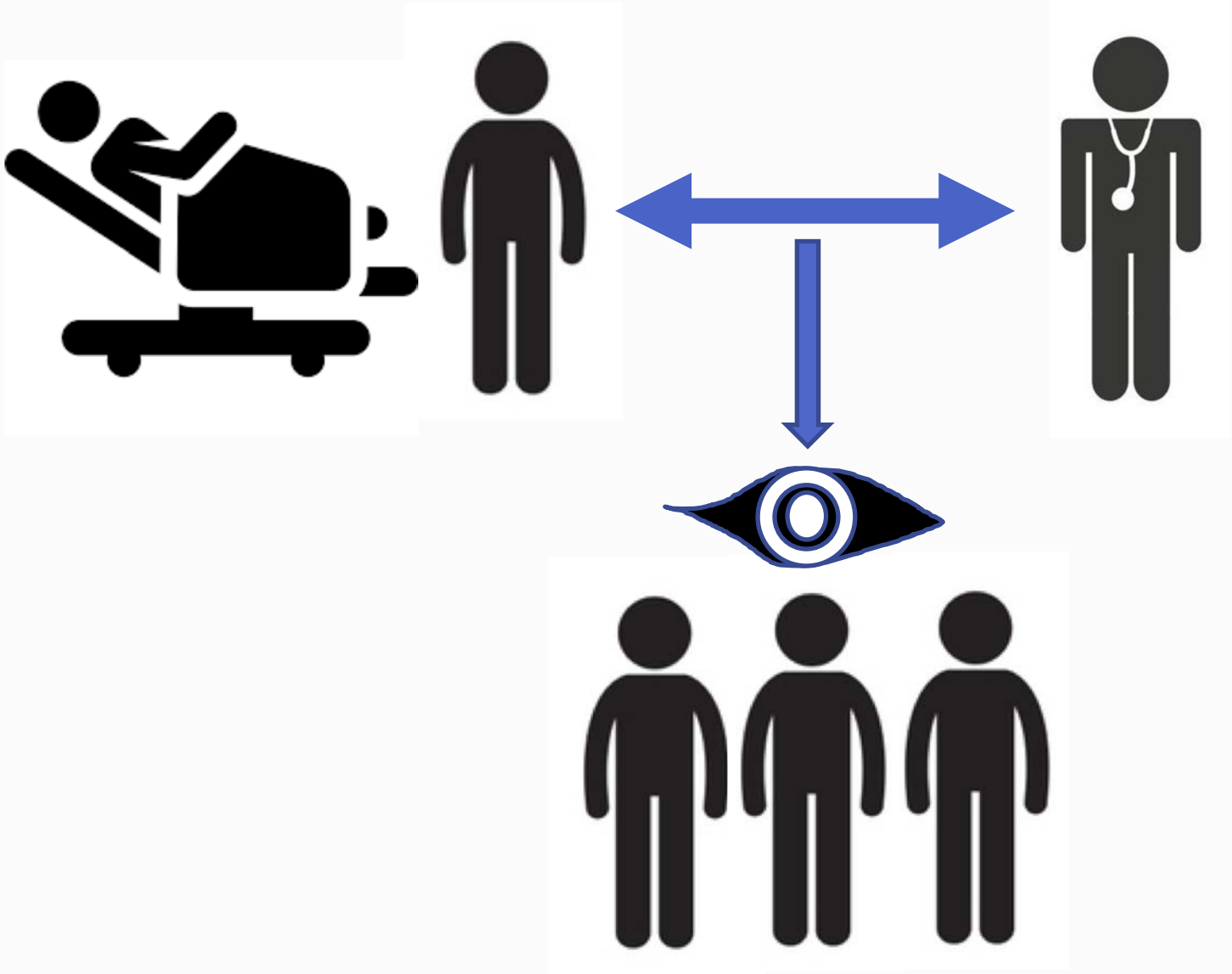


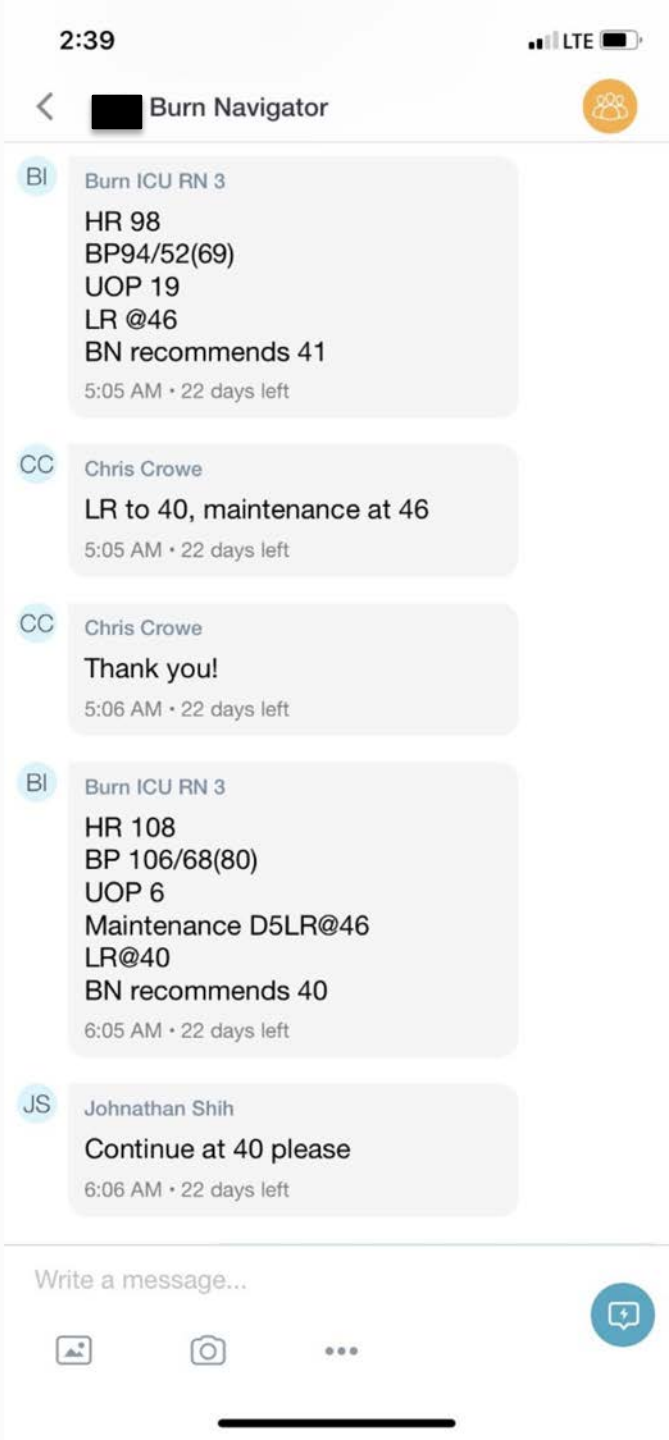
Salinas et al.Critical Care Medicine 39(9):2031-2038, 2011.


Weight:71kg
TBSA:75%
HPB:19
18:04
Patient
Home
Notes
I/O Table
Volume
I/O Graph
Cumulative Infusion Volume
Show Modified Brooke 2mL/kg/TBSA (10,650mL)
Show Parkland 4mL/kg/TBSA (21,300mL)
Show Galveston (10,320mL)
Parkland
250 mL/kg/24 Hours (17,750mL)
200 mL/kg/24 Hours (14,200mL)
Modified Brooke
Projected 24 hour volume at current rate
3.4 mL/kg/TBSA
Time
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00


Patient [redacted]
Weight:71kg
TBSA:75%
HPB:19
18:04
Patient
Home
Notes
I/O Table
Volume
I/O Graph
Fluids In/Out
Additonal Fluids
Primary Fluids
Recommendation(dash)
<30mL
30-50mL
>50mL
Fluids In (ml/hr)
3,000
2,750
2,500
2,250
2,000
1,750
1,500
1,250
1,000
750
500
250
0
Urine Out (mL)
25
50
75
100
125
150
Time
23:00 00:00 01:00 02:00 03:00 04:00 05:00 06:00 07:00 08:00 09:00 10:00 11:00 12:00 13:00 14:00 15:00 16:00 17:00 18:00 19:00 20:00 21:00 22:00
HPB
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

COMBINING WITH TEAM-BASED COMMUNICATION





UW Medicine
HARBORVIEW MEDICAL CENTER
REGIONAL BURN CENTER

Adult Burn Fluid Resuscitation Guideline

- Adults > 18yrs
- **Burn Navigator (BN): set on custom settings with UO goal set at 30 mL-30 mL /hr**
- **Tiger Text (TT) hourly template: HR, SBP,MAP, UO, IVF, Albumin, TF, BG, bladder pressure, BN rec, RN rec**
- **TT on the ½ hr for high UO > 50 mL should include: UO for the ½ hr only (note that its a ½ hr) current fluid rate, RN rec**
- Do not suggest fluid changes the first hour the patient is in the unit. Empty all urine then start monitoring for an hour
- Maximum hourly fluids changes should not exceed 200 mL/hr unless ordered by Fellow/Attending
- Use clinical judgement, If UO high but BP low and HCT high consider maintaining the same fluid rate instead of decreasing
- Goal: UO 30 mL/hr, HR < 120, SBP > 90, temperature 37C

UO < 15mL/hr

Increase LR by at least 20% (recommend fluids In mL and round to the nearest **tenths** ie 76 = 80 mL)

If there has been an increase in fluids 2 hrs in a row with continued low UO, discuss the Albumin Protocol with the Burn team

UO 15-29 mL/hr

Increase LR by at least 10% (recommend fluids In mL and round to the nearest **tenths** ie 76 = 80 mL)

If there has been an increase in fluids 2 hrs in a row with continued low UO, discuss the Albumin Protocol with the Burn team

UO 30 mL/hr

Goal: UO 30 mL/hr Leave rate the same

UO 31-40 mL/hr

Decrease LR by ≤ 10% (recommend fluids In mL and round to the nearest **tenths** ie 76 = 80 mL)

UO 41-49mL/hr

Decrease LR by up to 20% (recommend fluids In mL and round to the nearest **tenths** ie 76 = 80 mL)

UO > 50 mL/hr

Decrease LR by up to 20% and recheck UO in ½ hr.

- If second ½ hr check is > 30 mL, decrease fluids by up to an additional 10% and recheck in another ½ hr.
- On the ½ hr, only send info on TT with current UO for the ½ hr only, current fluid rate, RN rec

Repeat q 1 hr

When maintenance fluids rate achieved (100 mL/hr),

- Prior to 24 hr, consider stopping the hourly TT but continue the BN for full 24 hrs
- When patient is 24 hrs post resuscitation consider discontinuing BN and TT

UO < 30 mL/hr for 2 or more hours despite increasing fluids; check foley

5% Albumin Protocol Failing Resuscitation

- Start 5% Albumin at 50 mL/hr, 8 hr post burn
- Ideally, 5% Albumin rate approximately 10% of LR rate ie 1000 mL/hr= 100 ml albumin. Rate > 100 mL needs Fellow/ Attending approval
- RN to add volume of remaining albumin to TT, when approaching maintenance fluid rate, to avoid wastage.
- Use remaining albumin when possible

Other Failing Resuscitation

- If patient receives 1 ½ x's predicted fluid (6mL/kg/ tbsa) and fluids continue to increase, discuss next steps with Fellow/Attending.
- May consider early OR, CRRT or plasmapheresis

Exclusions: Pediatrics < 18 yrs and electrical burns

Tips:

- If UO high, check if glucose or ETOH elevated
- If UO is on the border of being low, use clinical judgment based on last hours trend of UO ie 31 mL says decrease by ≤ 10% but last hours UO was low and you just increased fluid, consider staying at the same rate one hour
- Consider decreasing fluids hourly, you can always go back up
- Discuss timing of weaning and discontinuing 5% albumin
- Toward the end of resuscitation, fluids may be switched to Plasmalyte or NS to better balance electrolytes
- Resuscitation is not an exact science, flexibility is required

9/16/2019

TEAM TRAINING

THANK YOU

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