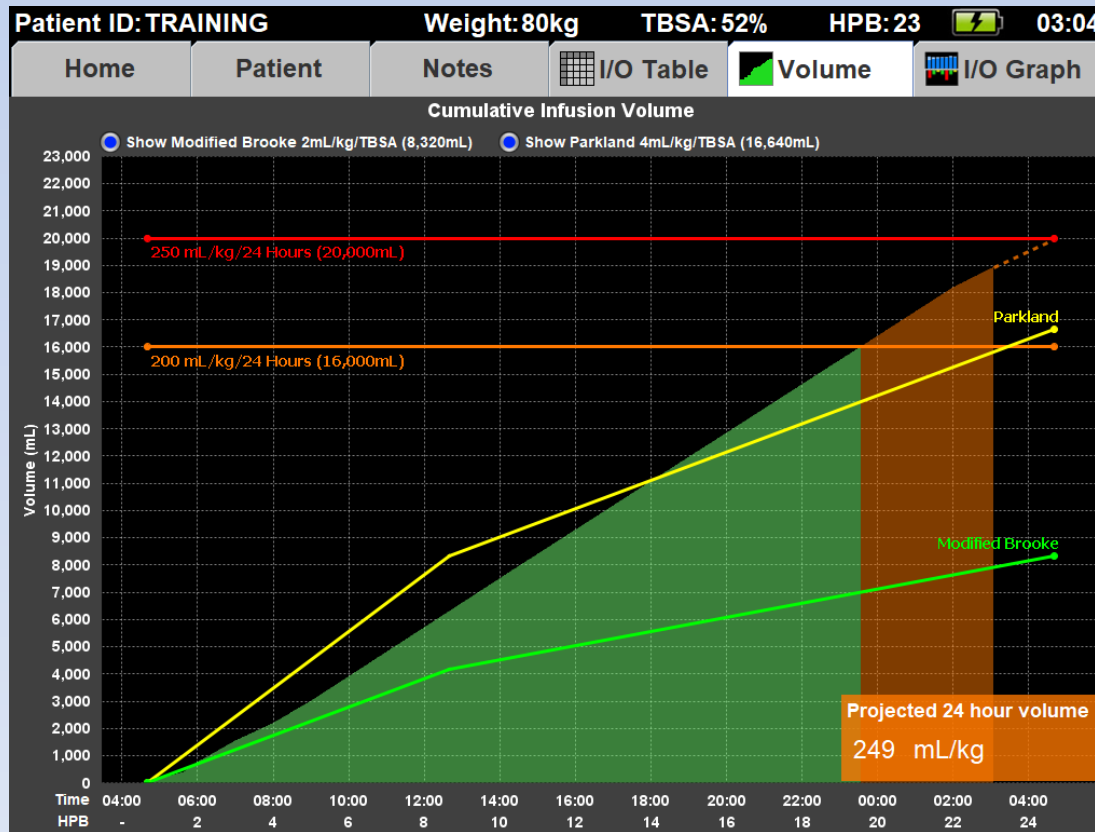


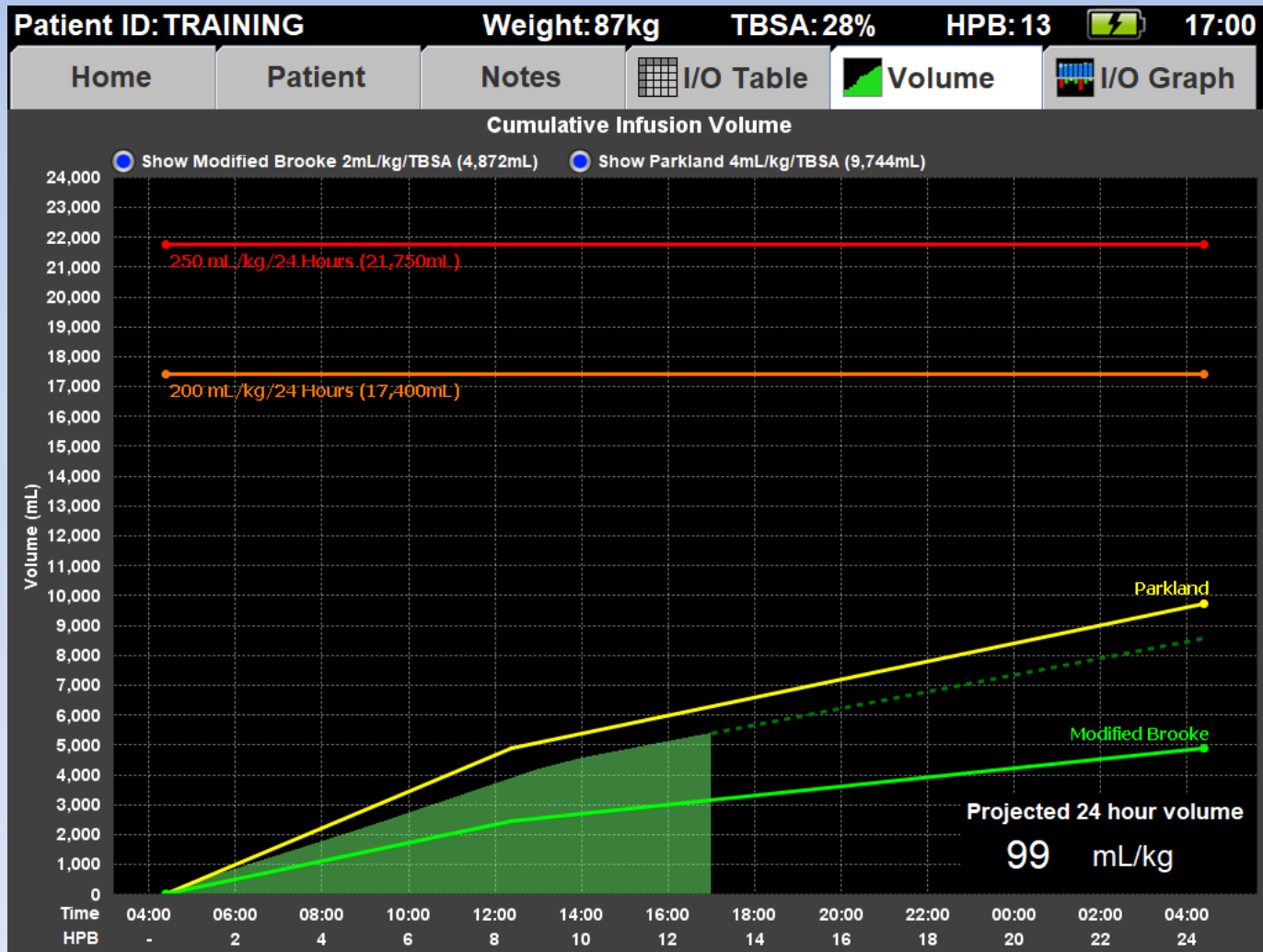
## Burn Navigator® RX Training Guide Adult Example



# What is Burn Navigator?

Burn Navigator is a Clinical Decision Support tool to help health care providers manage IV fluid therapy for adult and pediatric severe burn patients.

# Monitor Resuscitations



This resuscitation is going well.



# Clinical Data

- **Army's Initial Retrospective Study** (before and after, n=70)<sup>1</sup>
  - 35% additional time in target Urine Output range
  - 24 hour fluids given reduced from 6.5 to 4.2 mL/kg/TBSA
  - 2.5 fewer ventilator days
  - Decreased mortality between cohorts
- **Army Retrospective Review** (n=207)<sup>2</sup>
  - 24 hour fluids given were 3.5 mL/kg/TBSA
  - Mean urine output for initial 24 hours was 55 mL/hr
- **UTMB Retrospective Review** (n=154)<sup>3</sup>
  - AKI incidence reduced from 15% to 6% in first five days (p=.089)

1 Salinas, J et al, Computerized decision support system improves fluid resuscitation following severe burns: An original study, Crit Care Med 2011, 39(9), 2031-8.

2 J Salinas et al, *Review of Patients Resuscitated Using a Computerized Decision Support System in A Burn Intensive Care Unit*. Crit Care Med 2012, 225: Abstract only.

3 Sheaffer J et al, *Incidence of Acute Kidney Injury in Computerized Decision Support System Guided Fluid Resuscitations*, American Burn Association Oral Presentation, 24 March 2017.

# Indications for Use

- The Burn Navigator is indicated for use in the care of adult patients with 20% or more Total Body Surface Area (TBSA) burned, or pediatric patients, 24 months old or older, weighing at least 10 kg with 15% or more TBSA burned, as a fluid resuscitation monitor and calculator for hourly fluid recommendations.
- The Burn Navigator is intended to be used for burn patients of all ages, weights and co-morbidities as a fluid resuscitation monitor.
- The Burn Navigator is intended to be initiated within 24 hours of the burn incident and to be used no longer than 72 hours post burn.

# Protocols

Patient ID: TRAINING

Weight: 70kg

TBSA:

HPB:



10:10

Select the patient protocol:

**Adult predictive algorithm**

Targets 30-50 mL/hr urine output

Up to 15 % changes each hour

Recommended for most adults without gross myoglobinuria

**Custom protocol**

Target:  to    mL/kg/hr UO

Limited to 10 % changes each hour

Recommended for pediatric patients

**Monitor only**

No hourly recommendations

Provides resuscitation graphs and alerts

Back

Next

# Adult Predictive Protocol

- Uses the **Salinas algorithm** developed by U.S. Army Burn Center<sup>1</sup>.
- The Salinas algorithm uses the trend of the last three hours of UO to recommend the next hour's IV infusion rate.
- The Salinas algorithm will go up to the hourly cap chosen by your medical director (e.g., 10%, 15% or 20% each hour).
- This protocol is recommend for most adult patients who do not have resuscitation confounders.

## Adult predictive algorithm

Targets 30-50 mL/hr urine output

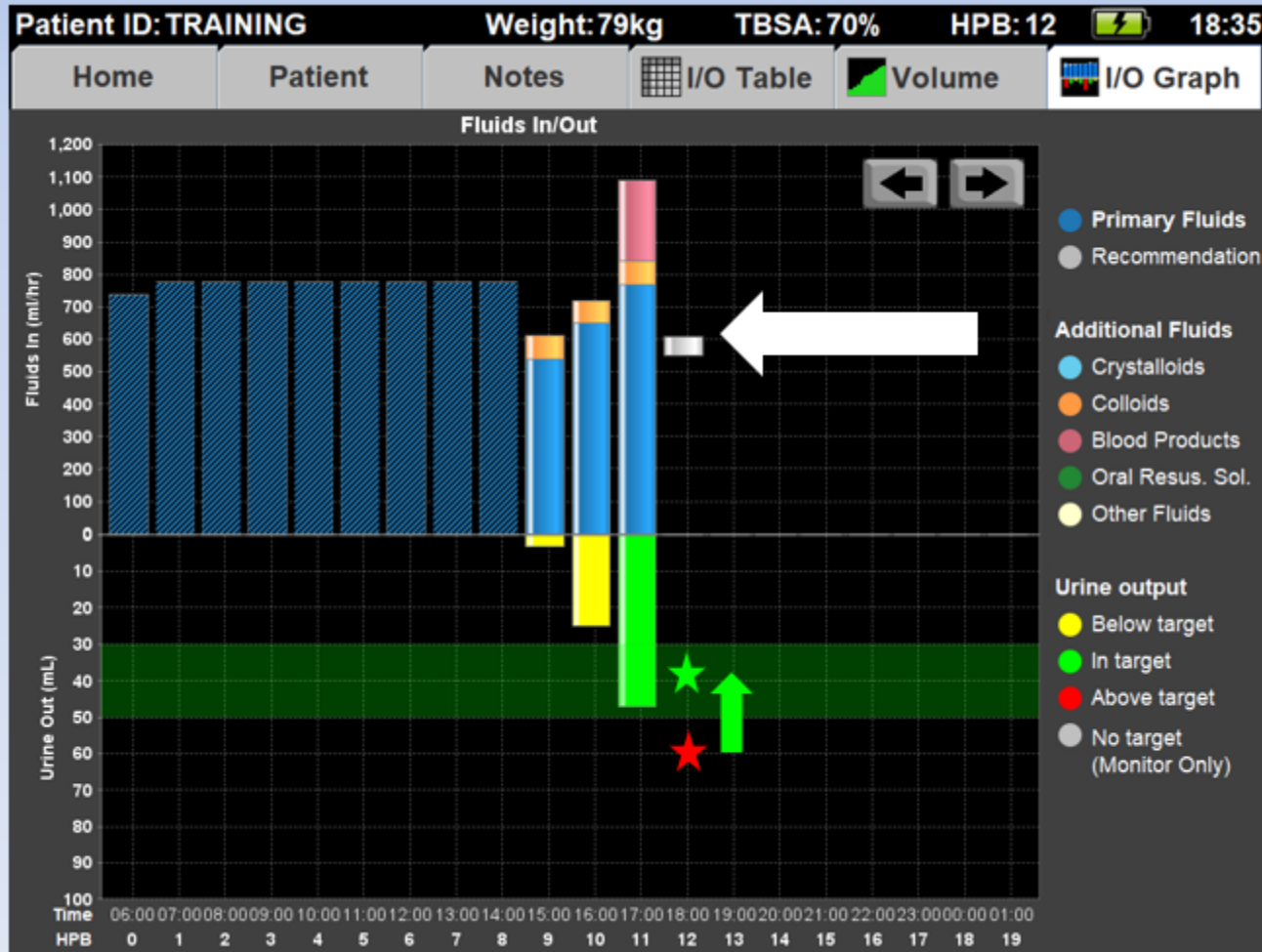
Up to 25 % changes each hour

Recommended for most adults without gross myoglobinuria

<sup>1</sup> Salinas, J et al, Computerized decision support system improves fluid resuscitation following severe burns: An original study, Crit Care Med 2011, 39(9), 2031-8.



# Adult Protocol uses a 3-hour trending algorithm



# Custom Protocol

- Allows clinicians to set a target Urine Output range in **mL** or **mL/kg** each hour.
- If the patient's UO is not in target, then the Custom Protocol will recommend increasing or decreasing the IV fluid rate by 10%.

## Custom protocol

Target: 0.8 ▼ to 1.2 ▼ mL/kg ▼ 10 - 14 mL/hr UO

Limited to 10% changes each hour

Recommended for pediatric patients

# Monitor Only

- Monitor Only provides resuscitation graphs, projections and alerts
- Monitor Only does not provide an hourly IV fluid recommendation based on UO
- Choose this protocol when UO is not a good surrogate of general organ perfusion (such as acute renal failure or with diuretics) or if the patient does not have a Foley catheter



## Monitor only

No hourly recommendations

Provides resuscitation graphs and alerts


# Clinical Decision Support (CDS)

- As a CDS tool, Burn Navigator is not intended to replace clinical decision judgement, rather it informs clinical decision making.
- Users should always rely on their clinical judgment when making decision regarding patient care. The Burn Navigator recommendations are not a substitute for clinical judgment.

# Interface

**White fields  
you can edit**

**Gray fields you  
cannot edit**

Patient ID: TRAINING      Weight: 79kg      TBSA:      HPB:            16:12

Select primary resuscitation fluid:


Lactated Ringer's ▼

Select initial rate formula:

3 mL/kg/TBSA ▼


Recommended rate: 520 mL/hr      Enter new rate: 520 mL/hr

Back      Enter



Press  
"Training Mode"



Patient ID:                      Weight:                      TBSA:                      HPB:                                            08:53

# Burn Navigator Main Menu

Start New Patient


Training Mode

Review Patient

System

Turn Off System

Device ID: BurnNav                      Version:V.6.1b

Patient ID: TRAINING      Weight: 80kg      TBSA:      HPB:            11:51

### New Patient Information

Enter patient identification:

Enter patient weight:

 kg    or     lbs

**Enter weight**

- You can enter **kg** or **lbs**.



**Then, press "Next"**





# Confounders

Does the patient have...

Gross myoglobinuria?  Yes  No  Unknown

High blood alcohol/EtOH?  Yes  No  Unknown

Hyperglycemia?  Yes  No  Unknown

End stage renal disease?  Yes  No  Unknown


Congestive heart failure?  Yes  No  Unknown

Back

Next



# Choose Adult predictive algorithm

Patient ID: TRAINING      Weight: 70kg      TBSA:      HPB:            10:10

Select the patient protocol:


**Adult predictive algorithm**  
Targets 30-50 mL/hr urine output  
Up to 15 % changes each hour  
Recommended for most adults without gross myoglobinuria

**Custom protocol**  
Target:  to    mL/kg/hr UO  
Limited to 10 % changes each hour  
Recommended for pediatric patients

**Monitor only**  
No hourly recommendations  
Provides resuscitation graphs and alerts

# Enter TBSA

- Be as accurate as you can be
- Only count 2<sup>nd</sup> and 3<sup>rd</sup> degree

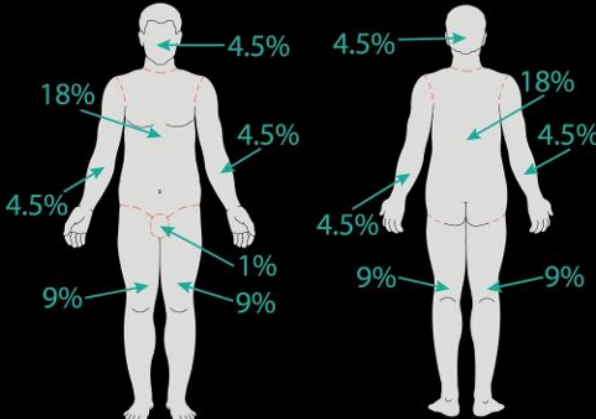
Patient ID: TRAINING      Weight: 80kg      TBSA:      HPB:            12:59

Enter total body surface area burned (TBSA):

70 %

**NOTE: Only include 2nd and 3rd degree burns for TBSA.**


- 18+ years
- 15 to 17 years
- 10 to 14 years
- 5 to 9 years
- 1 to 4 years
- Birth to 1 year



Back      Next

# Enter height

(it is optional for adult predictive algorithm)

Patient ID: TRAINING      Weight: 80kg      TBSA:      HPB:            09:04

Enter patient height:  
(Optional for adult predictive algorithm)

--- cm    or    --- inches

Body surface area:  
--- m<sup>2</sup>

TBSA:      Burned surface area:  
70 %      --- m<sup>2</sup>

Back      Next


**Enter how long ago the patient was burned in hours and minutes**

If you don't know, make your best guess

The screenshot shows a mobile application interface with a black background and white text. At the top, there is a status bar with the following information: Patient ID: TRAINING, Weight: 80kg, TBSA:, HPB:, a battery icon, and the time 14:13. Below the status bar, the text "Enter elapsed time since burn occurred:" is displayed. Underneath, there are two input fields: the first contains the number "9" followed by the word "hours", and the second contains "--" followed by the word "minutes". A blue arrow points from the text "Enter how long ago the patient was burned in hours and minutes" to the "9" in the first input field. Below the input fields, the text "Time of burn:" is displayed. Underneath, there is a dark grey rounded rectangle containing the text "05:13" followed by "13-Mar-2018". A blue arrow points from the text "The software will calculate time of burn" to the "13-Mar-2018" part of the date. Below the date input, there is a button labeled "Change current Date/Time". At the bottom right of the screen, there are two buttons labeled "Back" and "Next".

The software will calculate time of burn

**Enter  
total fluids given  
and urine output  
since the burn  
until now**

Patient ID: TRAINING      Weight: 80kg      TBSA:      HPB:            09:03

Enter fluids given until now:


7,000      mL

Enter urine output until now:

---      mL

Back      Next

If you don't know this information now,  
you can leave it blank and enter it later

Patient ID: TRAINING      Weight: 80kg      TBSA:      HPB:            11:38

Select primary resuscitation fluid:

Lactated Ringer's ▼

Select initial rate formula:

3 mL/kg/TBSA ▼

Recommended rate:      Enter new rate:

530 mL/hr      530 mL/hr

Back      Enter

You can select different starting formulas

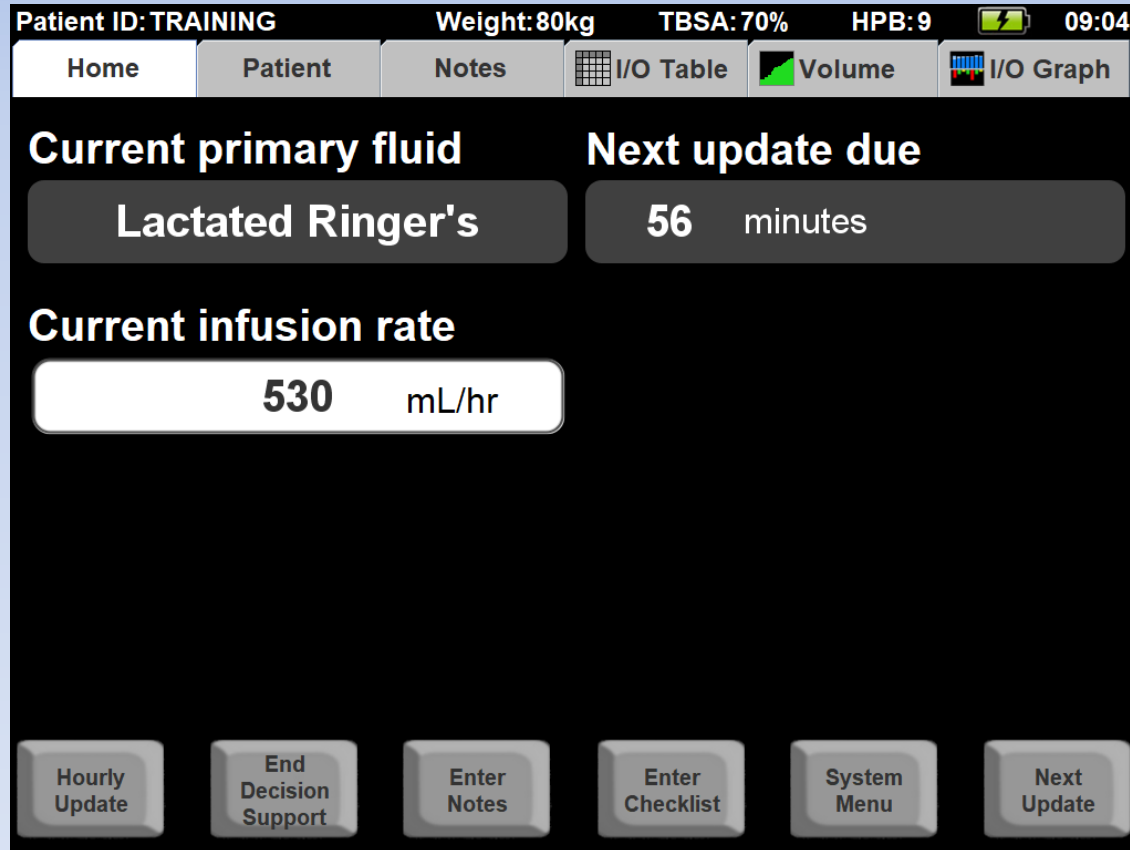


Your physician may want you to start at a different rate. If so, enter the rate here.

Lactated Ringer's is the default fluid. You can change fluid types.

# You've completed the new patient setup!

## Now you see the Home Screen



Press "Enter Checklist"

# Enter checklist information

**Checklist**

**Enter Vitals**

✓ Systolic BP  mmHg

✓ Diastolic BP  mmHg

CVP  mmHg

✓ Heart rate  bpm

**Enter Bladder Pressure**

Bladder pressure  mmHg

**Enter Labs**

ScvO2  %

✓ Lactate  mg/dL

Base excess  mEq/L

✓ Hemoglobin  g/dL

**Check Extremities**

✓ Elevate burned extremities

✓ Check for tightness

**Check Pulses**

✓ Left upper  ▼

✓ Right upper  ▼

✓ Left lower  ▼

✓ Right lower  ▼

← Don't forget these!

← Drop-down selections

Checklists are recommended:

- When starting a new resuscitation
- Every 6 hours



# Advance time to the next update

The screenshot shows a medical software interface with a black background and white text. At the top, patient information is displayed: Patient ID: TRAINING, Weight: 80kg, TBSA: 70%, HPB: 9, a battery icon, and the time 09:06. Below this is a navigation bar with buttons for Home, Patient, Notes, I/O Table, Volume, and I/O Graph. The main area contains four data points: Current primary fluid (Lactated Ringer's), Next update due (54 minutes), Current infusion rate (530 mL/hr), and Projected 24 hour volume (2.7 mL/kg/TBSA). At the bottom is a row of six buttons: Hourly Update, End Decision Support, Enter Notes, Enter Checklist, System Menu, and Next Update. A blue arrow points to the 'Next Update' button.

Patient ID: TRAINING    Weight: 80kg    TBSA: 70%    HPB: 9    09:06

Home    Patient    Notes    I/O Table    Volume    I/O Graph

**Current primary fluid**  
Lactated Ringer's


**Next update due**  
54 minutes

**Current infusion rate**  
530 mL/hr

**Projected 24 hour volume**  
2.7 mL/kg/TBSA

Hourly Update    End Decision Support    Enter Notes    Enter Checklist    System Menu    Next Update

Press "Next Update"

Patient ID: TRAINING    Weight: 80kg    TBSA: 70%    HPB: 11        10:01

### Fluid Update: Urine Data

Urine measurement time:

From: 09:00 14-Mar-2018    To: 10:00 14-Mar-2018    60 mins.

Urine output volume:

mL     mL/kg/hr

Urine output not measured or unknown.

“**From**” time is the end of the last update

“**To**” time is when you collect UO data

**Enter 3 mL UO, then press “Next”**

## Fluids Given

From: 09:00    To: 10:00    60 mins.

Primary fluid was:

Lactated Ringer's

Infusion rate:

530 mL/hr

Infusion volume:

530 mL

Back    Next



Average rate for this time period

Volume for this time period

The rate and volume will be different if the time period is not 60 minutes

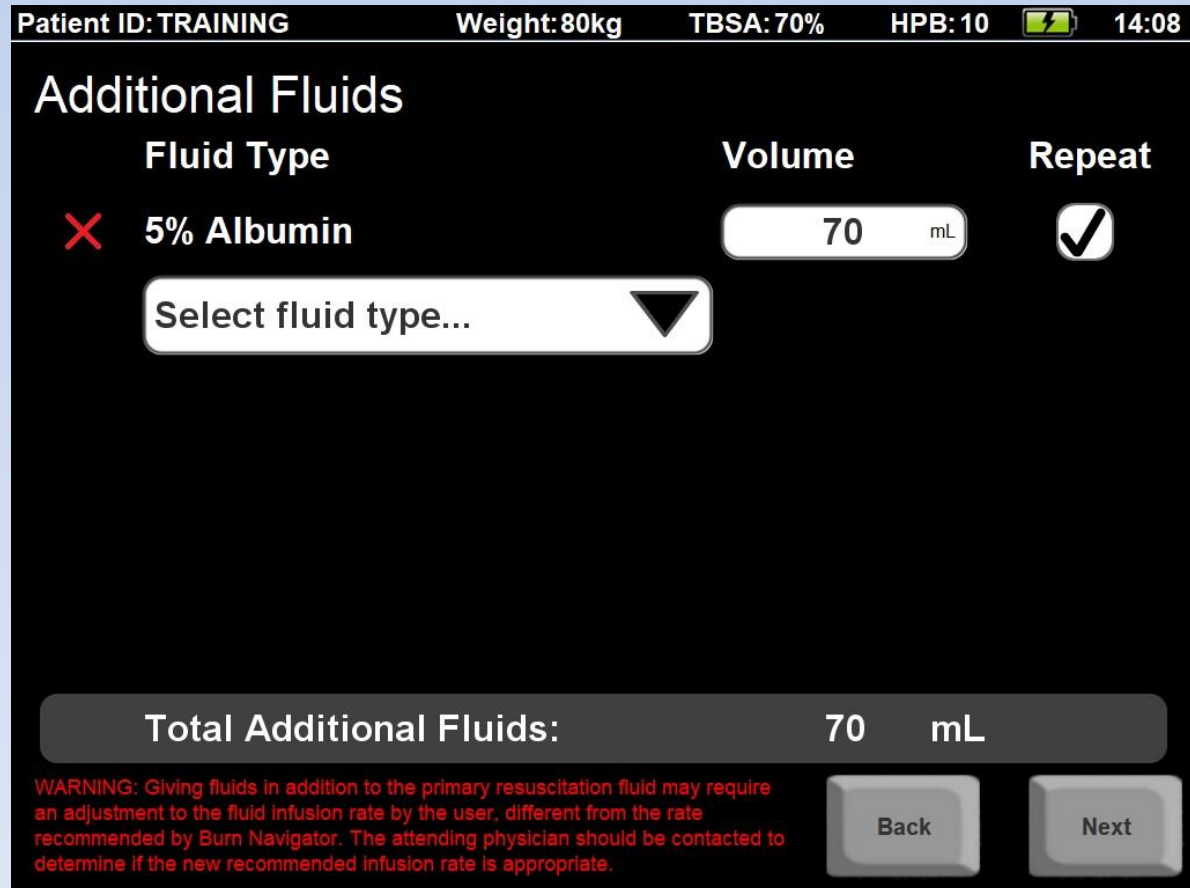
If you edit the volume, the average rate for the time period will be updated



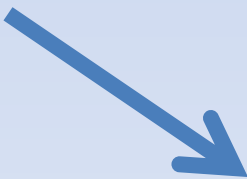
Click “Select a fluid type”

Choose “Albumin 5%”

Enter 70mL and click “Repeat”



You'll see this warning message anytime additional fluids are given, because the algorithm doesn't take those fluids into account



Patient ID: TRAINING      Weight: 80kg      TBSA: 70%      HPB: 10           14:08


### Additional Fluids

Fluid Type	Volume	Repeat
5% Albumin	70 mL	
Select fluid type...		

Total Additional Fluids: 70 mL

**WARNING:** Giving fluids in addition to the primary resuscitation fluid may require an adjustment to the fluid infusion rate by the user, different from the rate recommended by Burn Navigator. The attending physician should be contacted to determine if the new recommended infusion rate is appropriate.

Back      Next

Patient ID: TRAINING      Weight: 80kg      TBSA: 70%      HPB: 11            10:04

### New Rate

Previous infusion rate: 530 mL/hr

Fluid type: Lactated Ringer's ▼

Recommended rate:	New rate:
630 mL/hr 19% ↑	630 mL/hr 19% ↑

Back      Enter

New recommendation →

**Accept this recommendation by pressing “Enter”**

# Note that there are two Divisions of Additional Fluids: Adjunct Fluids & Other Fluids

Patient ID: TRAINING    Weight: 90kg    TBSA: 25%    HPB: 6    09:00

### Additional Fluids

Fluid Type	Volume	Repeat
Select fluid type... ▼		
Adjunct fluids category:		
Lactated Ringer's		
Normal Saline		
Plasma-lyte		
5% Albumin		

Total Additional Fluids: --- mL

Back    Next

Adjunct fluids are added to the total fluid volume and – if repeated – are included in the 24-hour fluid projection.

Patient ID: TRAINING    Weight: 75kg    TBSA: 35%    HPB: 11    18:02

### Additional Fluids

Fluid Type	Volume	Repeat
Select fluid type... ▼		
Other fluids category:		
LR + 5% Dextrose		
Tube Feeds		
IV Medications		
Other Fluids		

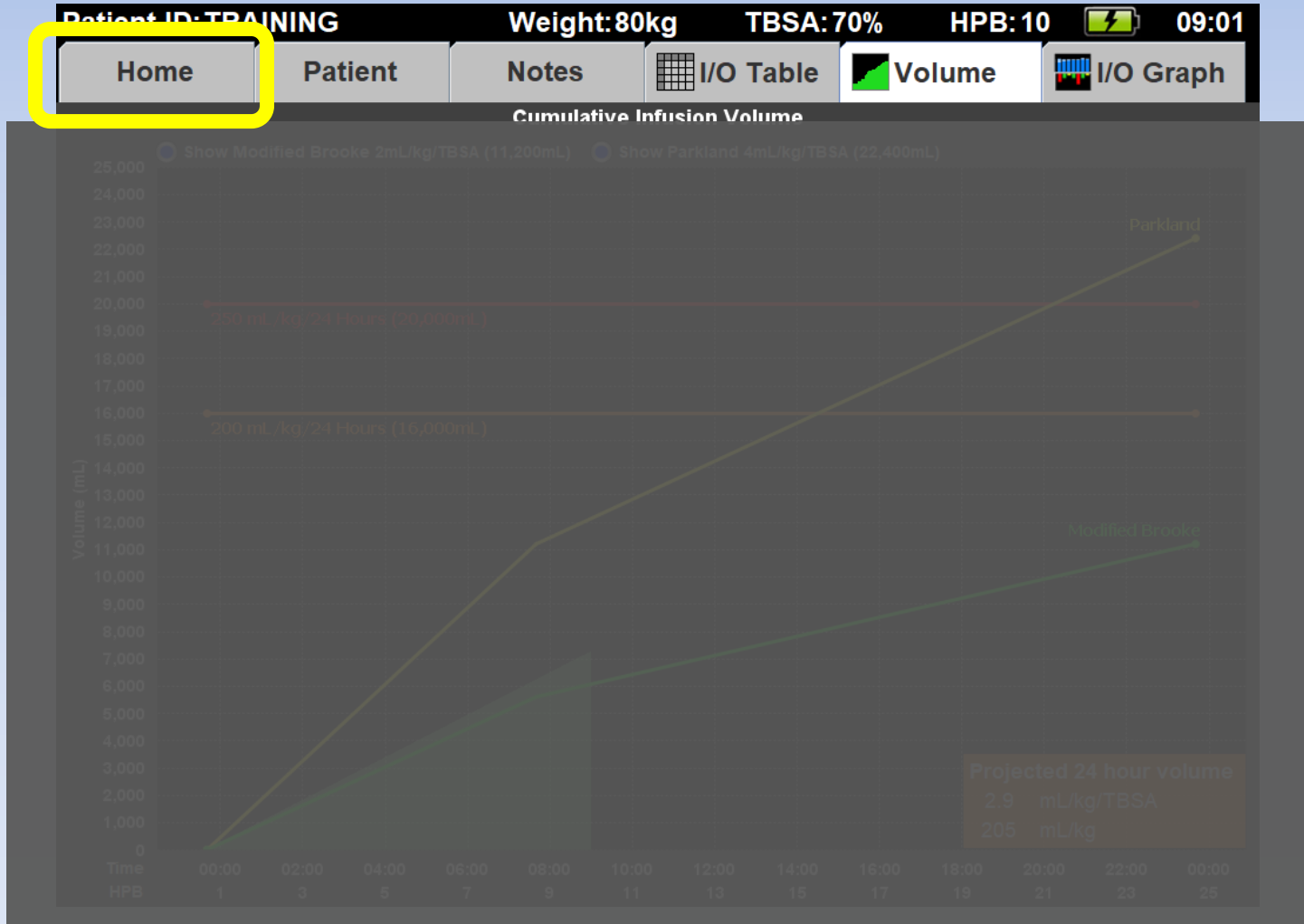
Total Additional Fluids: --- mL

Back    Next

Other Fluids are excluded from the Volume Graph and the 24-hour fluid projection.

# You now see the Volume Graph

## Press "Home" to do another update





EMERGENCY TRAINING    Weight: 80kg    TBSA: 70%    HPB: 10     12:03

**Home**    Patient    Notes     I/O Table     Volume     I/O Graph

Current primary fluid    Next update due

Lactated Ringer's    57 minutes

Current infusion rate    Projected 24 hour volume

630 mL/hr    2.9 mL/kg/TBSA

Hourly Update    End Decision Support    Enter Notes    Enter Checklist    System Menu    **Next Update**

press "Next Update"





## Fluid Update: Urine Data

Urine measurement time:

From: 10:00

21-Feb-2018

To: 11:00

21-Feb-2018

60 mins.

Urine output volume:

25 mL

0.3 mL/kg/hr

Urine output not measured or unknown.

Back

Next

**Enter UO,  
then press “Next”**

Patient ID: TRAINING

Weight: 80kg

TBSA: 70%

HPB: 11



11:01

## Fluids Given

From: 10:00

To: 11:00

60 mins.

Primary fluid was:

Lactated Ringer's



Infusion rate:

630 mL/hr

Infusion volume:

630 mL


Back

Next


Confirm the pump wasn't changed: **press Next**

Because you chose “Repeat” last time, the Albumin 5% is listed again.

**Press “Next”**

Patient ID: TRAINING      Weight: 80kg      TBSA: 70%      HPB: 10       14:08

### Additional Fluids

Fluid Type	Volume	Repeat
 5% Albumin	<input type="text" value="70"/> mL	<input checked="" type="checkbox"/>
<input type="text" value="Select fluid type..."/> ▼		

Total Additional Fluids:      70      mL

WARNING: Giving fluids in addition to the primary resuscitation fluid may require an adjustment to the fluid infusion rate by the user, different from the rate recommended by Burn Navigator. The attending physician should be contacted to determine if the new recommended infusion rate is appropriate.

Patient ID: TRAINING

Weight: 80kg

TBSA: 70%

HPB: 11



13:01

## New Rate


Previous infusion rate: 630 mL/hr

Fluid type: Lactated Ringer's

Recommended rate:

750 mL/hr 19% 

New rate:

750 mL/hr 19% 

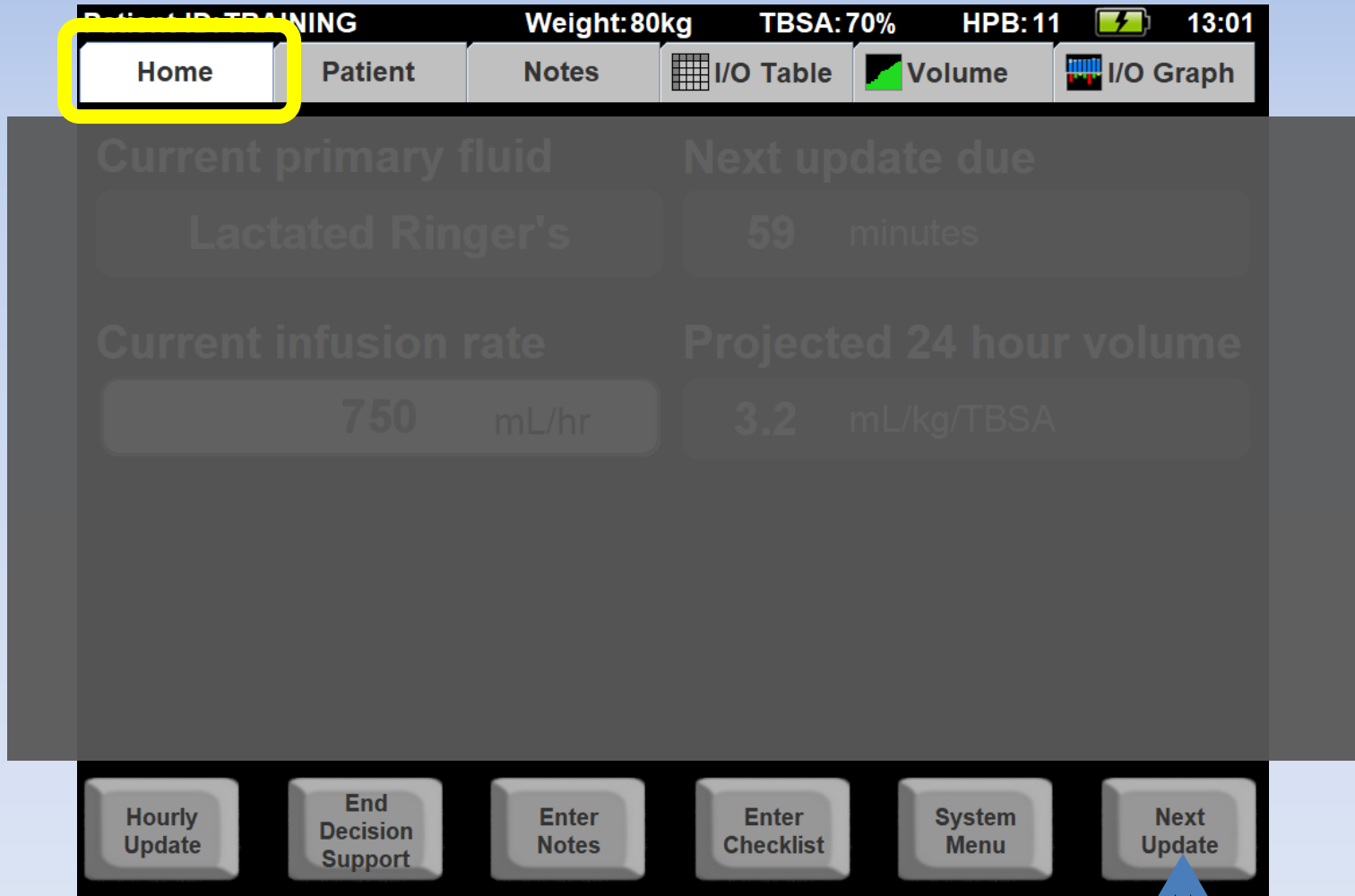
Back

Enter

**Accept this recommendation**

Let's do one more update

Press "Home"



then "Next Update"



## Fluid Update: Urine Data

Urine measurement time:

From: 11:00

21-Feb-2018

To: 12:00

21-Feb-2018

60 mins.

Urine output volume:

47 mL

0.6 mL/kg/hr

Urine output not measured or unknown.

Back

Next

**Enter UO**

Patient ID: TRAINING

Weight: 80kg

TBSA: 70%

HPB: 12



12:01

## Fluids Given

From: 11:00

To: 12:00

60 mins.

Primary fluid was:

Lactated Ringer's



Infusion rate:

750 mL/hr

Infusion volume:

750 mL

Back

Next

Confirm the pump wasn't changed: **press Next**





## Additional Fluids

	Fluid Type	Volume	Repeat
×	5% Albumin	70 mL	<input checked="" type="checkbox"/>
×	Fresh Frozen Plasma	250 mL	<input type="checkbox"/>
	Select fluid type...		

Total Additional Fluids: 320 mL

**WARNING:** Giving fluids in addition to the primary resuscitation fluid may require an adjustment to the fluid infusion rate by the user, different from the rate recommended by Burn Navigator. The attending physician should be contacted to determine if the new recommended infusion rate is appropriate.

Back

Next

**Add FFP, 250 mL  
(without repeat)**



## Safety Questions

Is patient hypotensive?  Yes  No

Is patient hyperglycemic?  Yes  No

Is patient on pressors?  Yes  No

Is patient on diuretics?  Yes  No

Back

Next

# Answer safety questions

Patient ID: TRAINING

Weight: 80kg

TBSA: 70%

HPB: 12



12:02

## New Rate

Previous infusion rate: 750 mL/hr

Fluid type: Lactated Ringer's

Recommended rate:

600 mL/hr

20%



New rate:

600 mL/hr

20%



Alert! Consult with attending physician about an appropriate fluid rate during presence of hypotension, hyperglycemia, pressors or diuretics.

Back

Enter

If you say “Yes” to a safety question, you’ll see this red text alert



## New Rate

Previous infusion rate: 750 mL/hr

Fluid type: Lactated Ringer's

Recommended rate:

600 mL/hr

20%



New rate:

750 mL/hr

0%

**Alert! Consult with attending physician about an appropriate fluid rate during presence of hypotension, hyperglycemia, pressors or diuretics.**

Back

Enter

Change “New rate” to be the “Previous” rate (**750 mL/hr**), because patient was hypotensive



## Attention:

When choosing an infusion rate other than what is recommended the following information is required.

### Select rationale:

Patient is hypotensive



### Enter attending physician:

MD

### Enter caregiver:

RN

Back

Enter

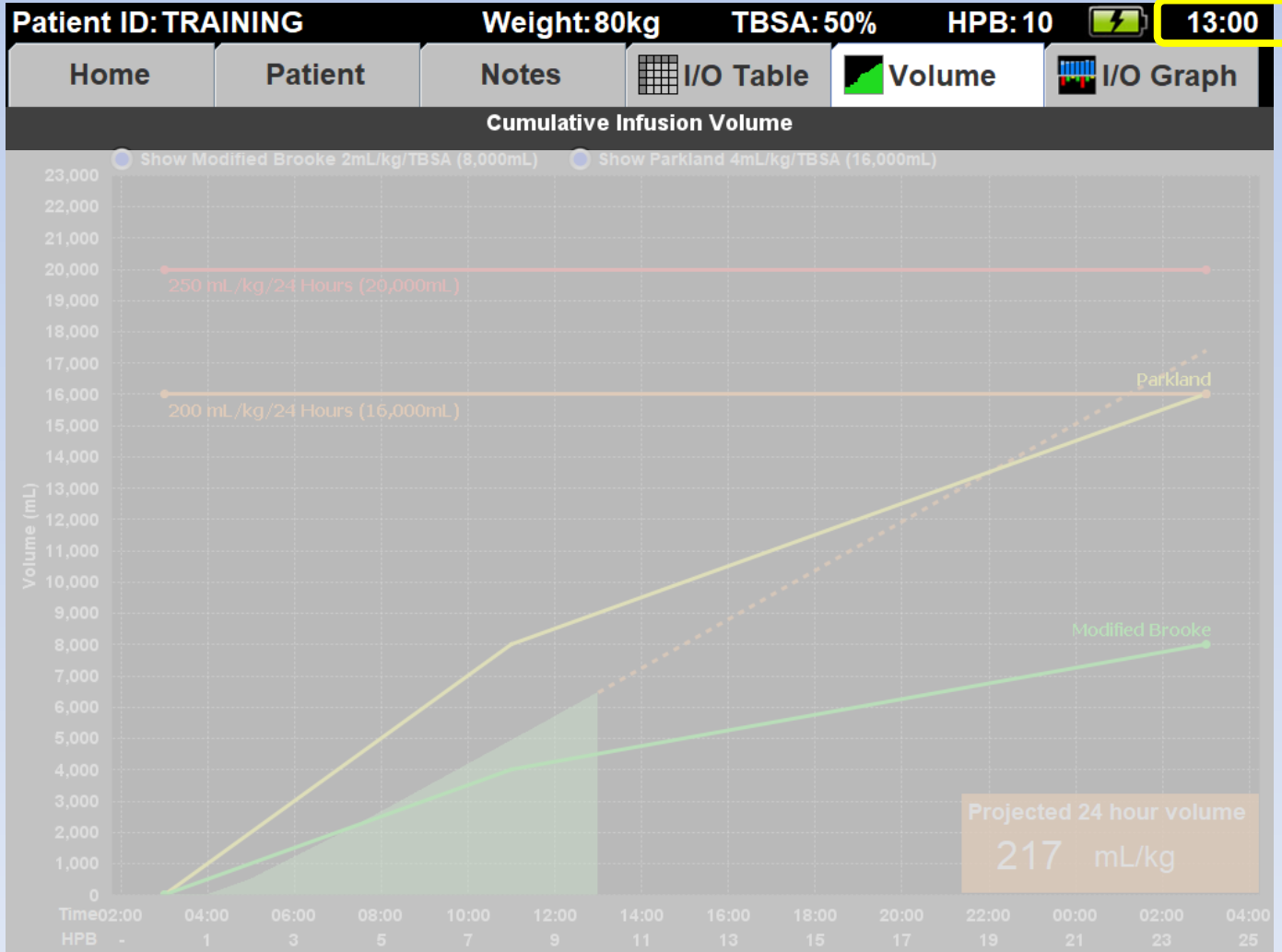
Choose a rationale why the recommendation wasn't accepted (you will see this later in the Notes)

# Main Screens

Six main tabs



HPB - Hours Post Burn

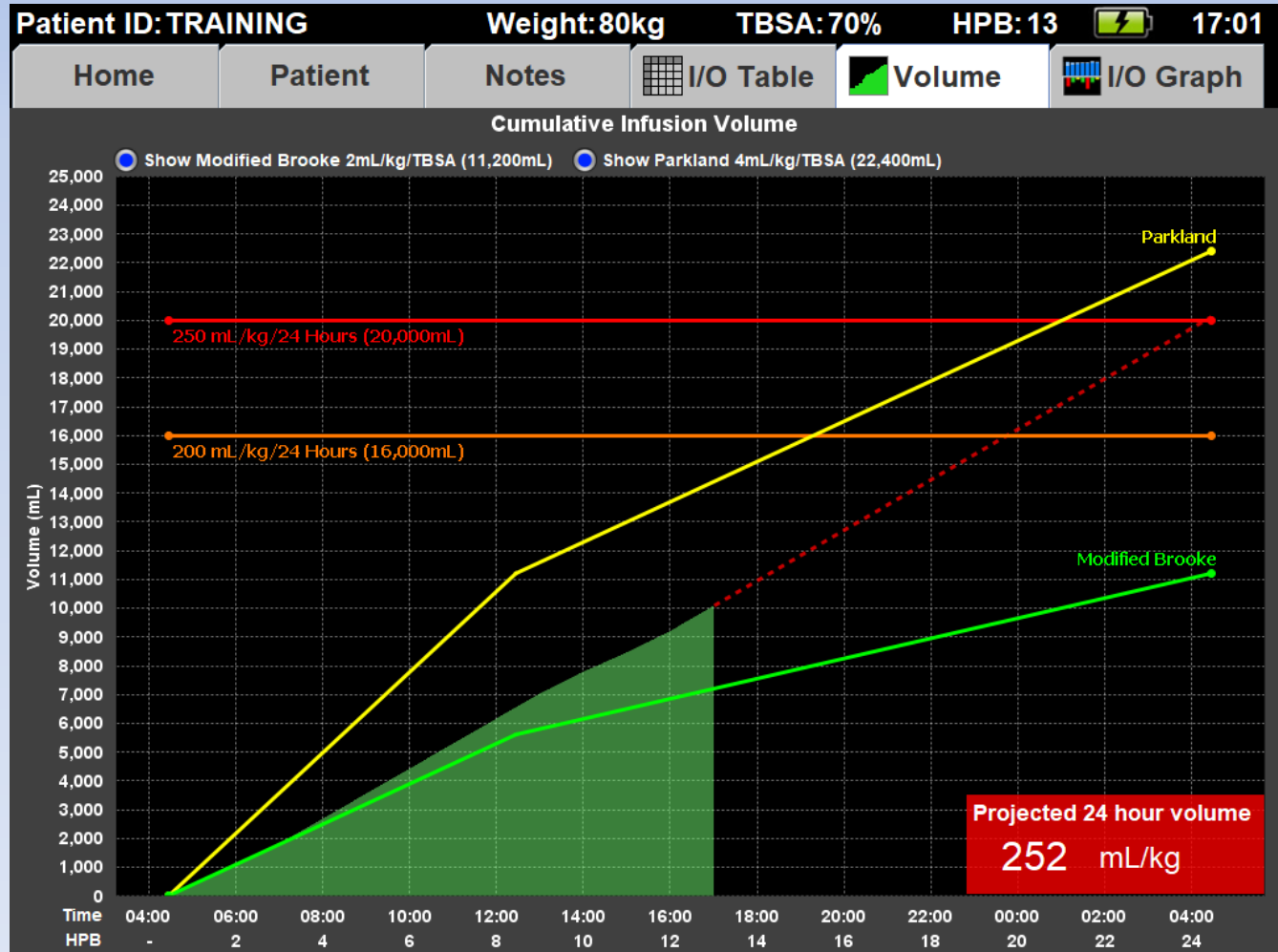


# After each update, you'll see the Volume graph

Shown are all fluids given to the patient since time of burn

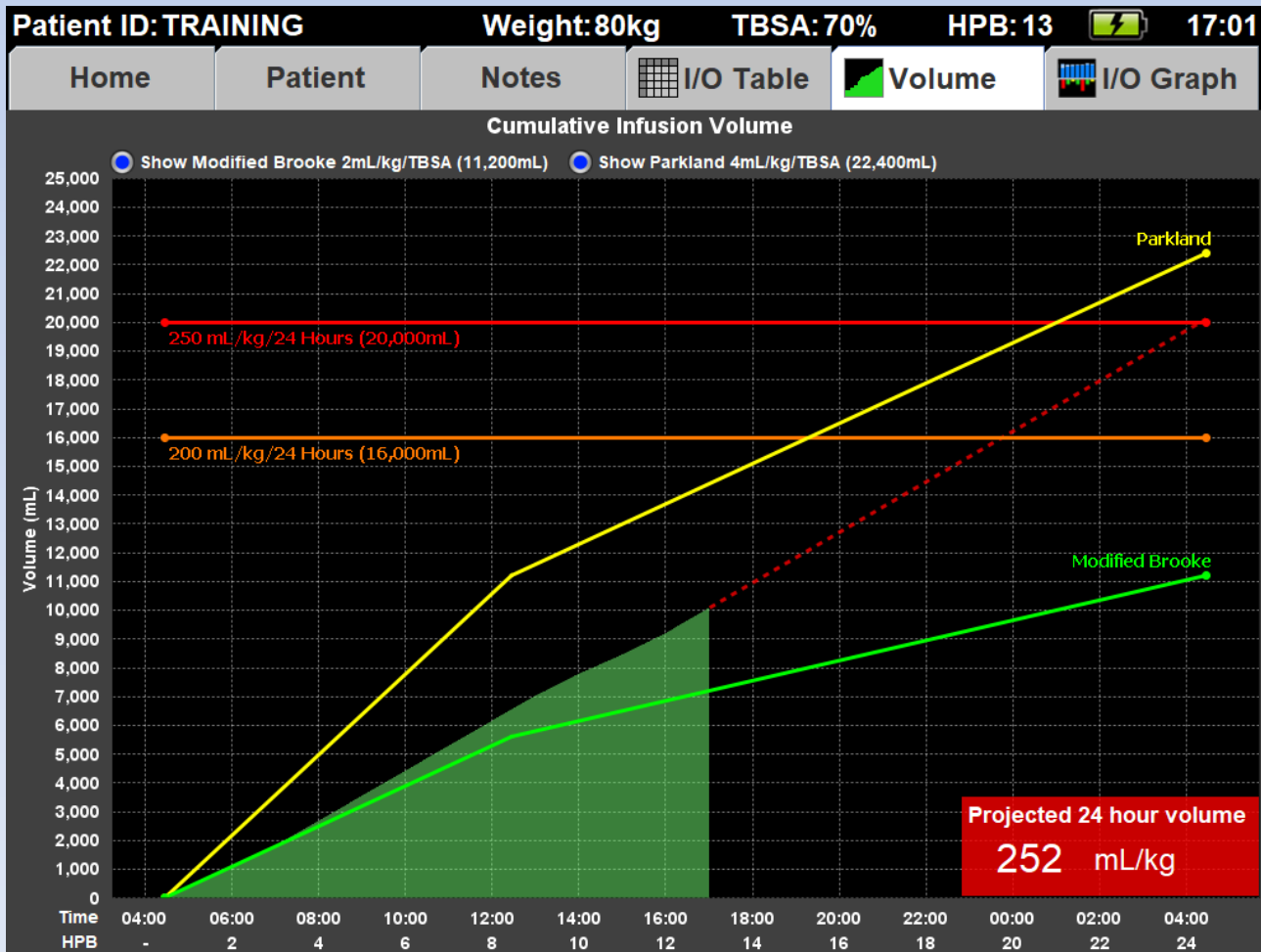
The “green mountain” of fluids grows over time

How much fluid has this patient received??



# Resuscitation guidelines:

- 4mL/kg/TBSA (Parkland) in yellow
- 2mL/kg/TBSA (Modified Brooke) in green

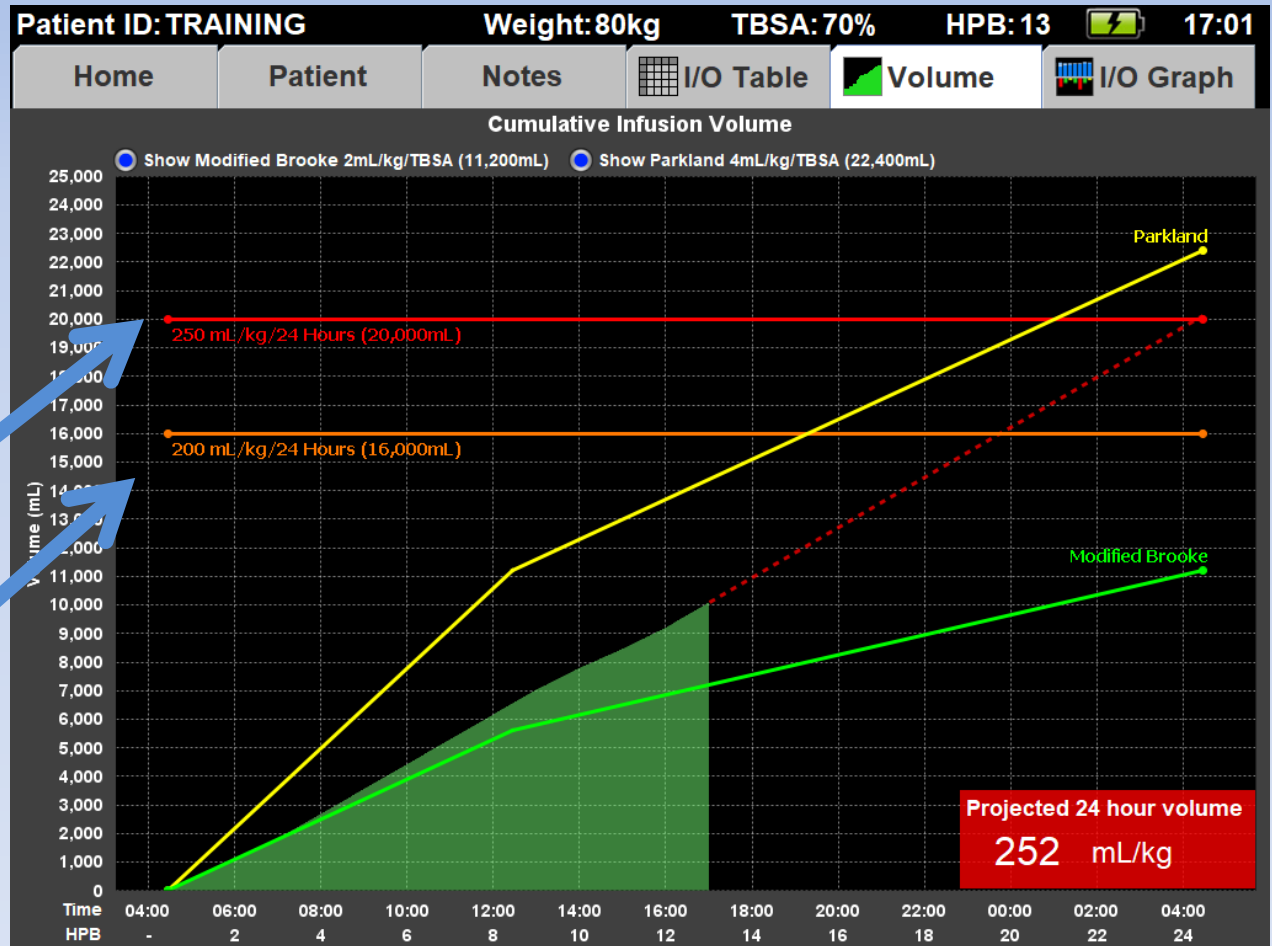




## Alert lines

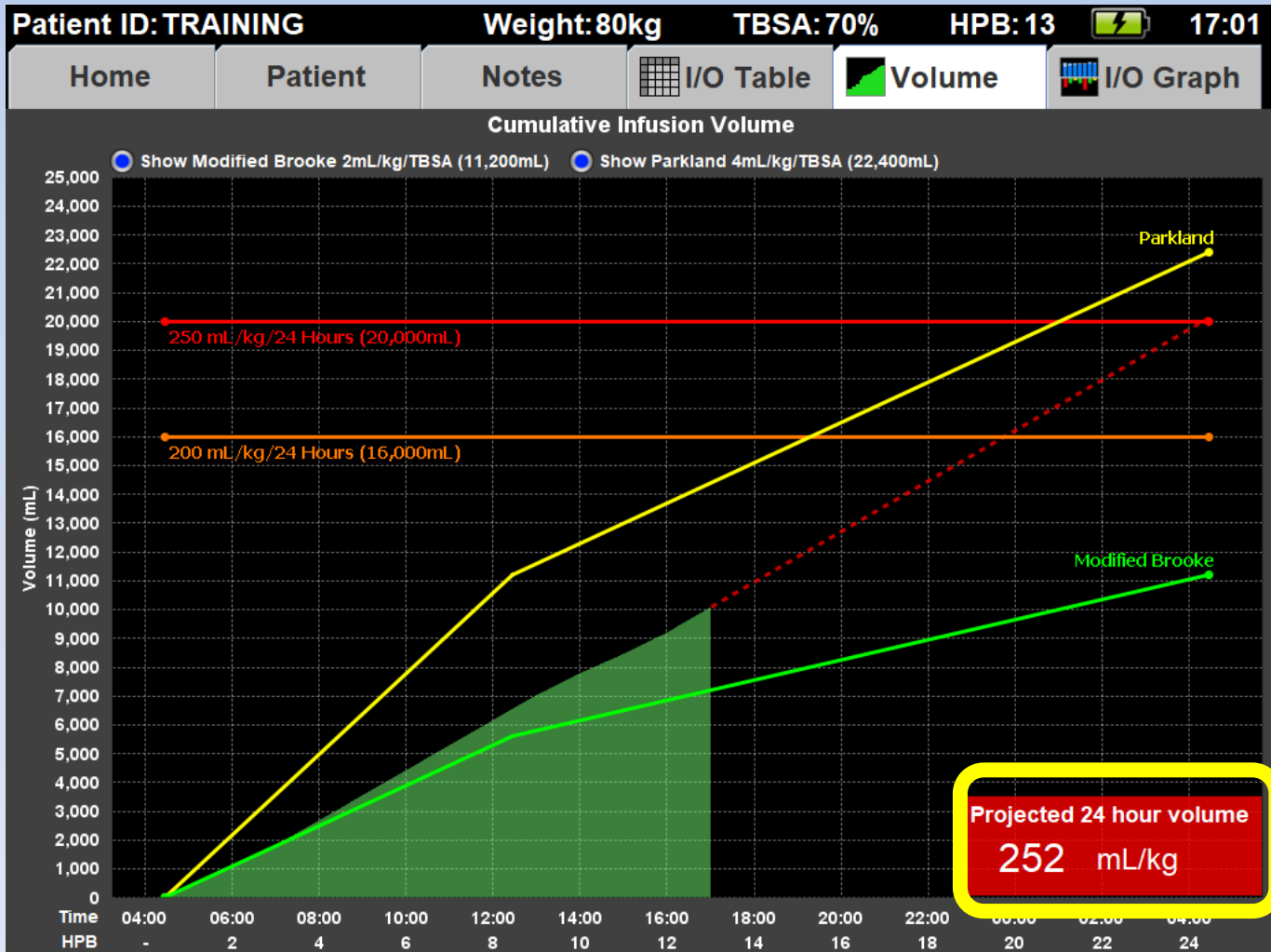
**250 mL/kg**  
in 24 hours  
**(Ivy Index) in red**

**200 mL/kg**  
in 24 hours  
**in orange**



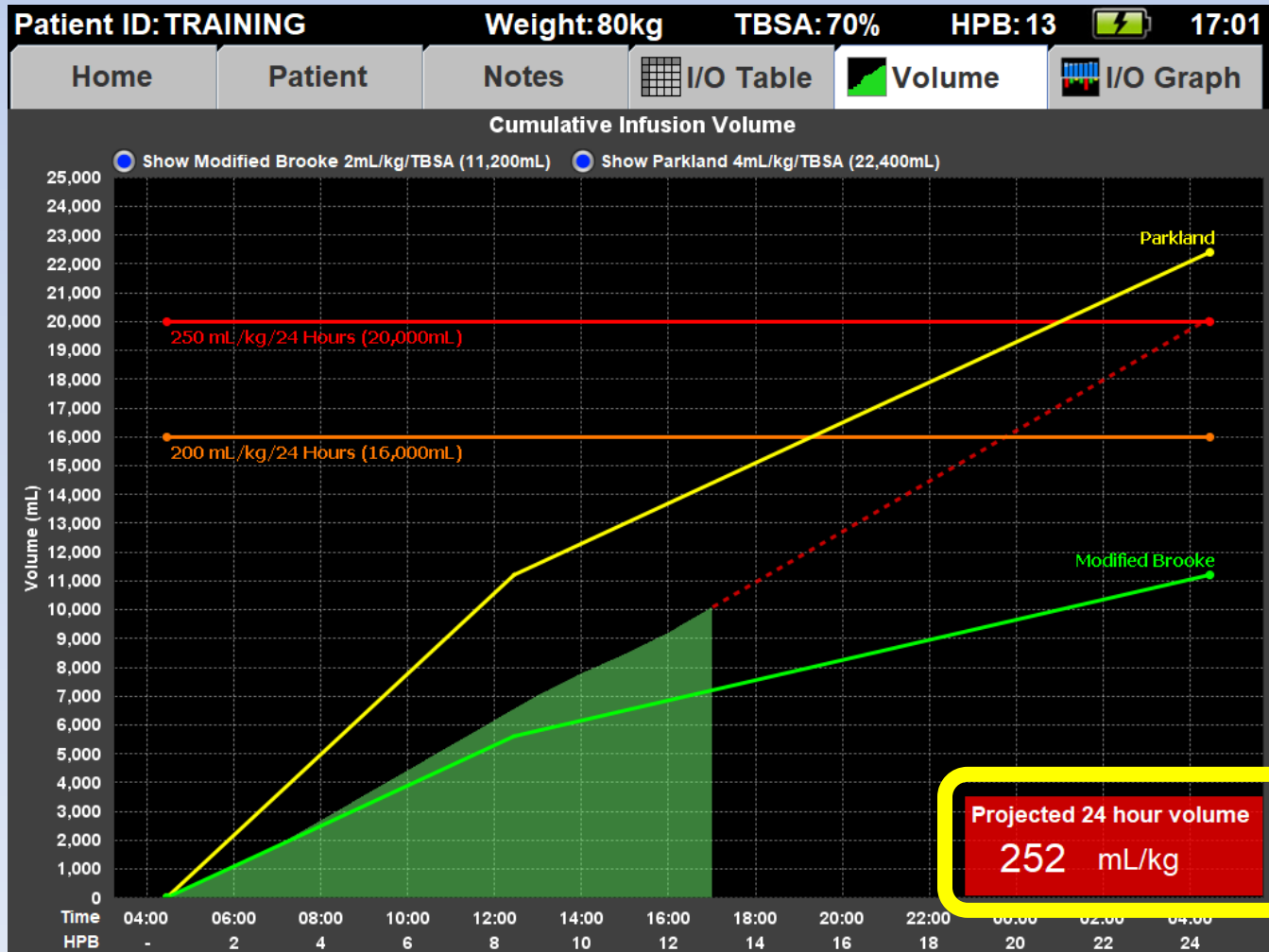
# 24-hour fluid projections:

- Shows by HPB 10
- Based on current rate & past fluids



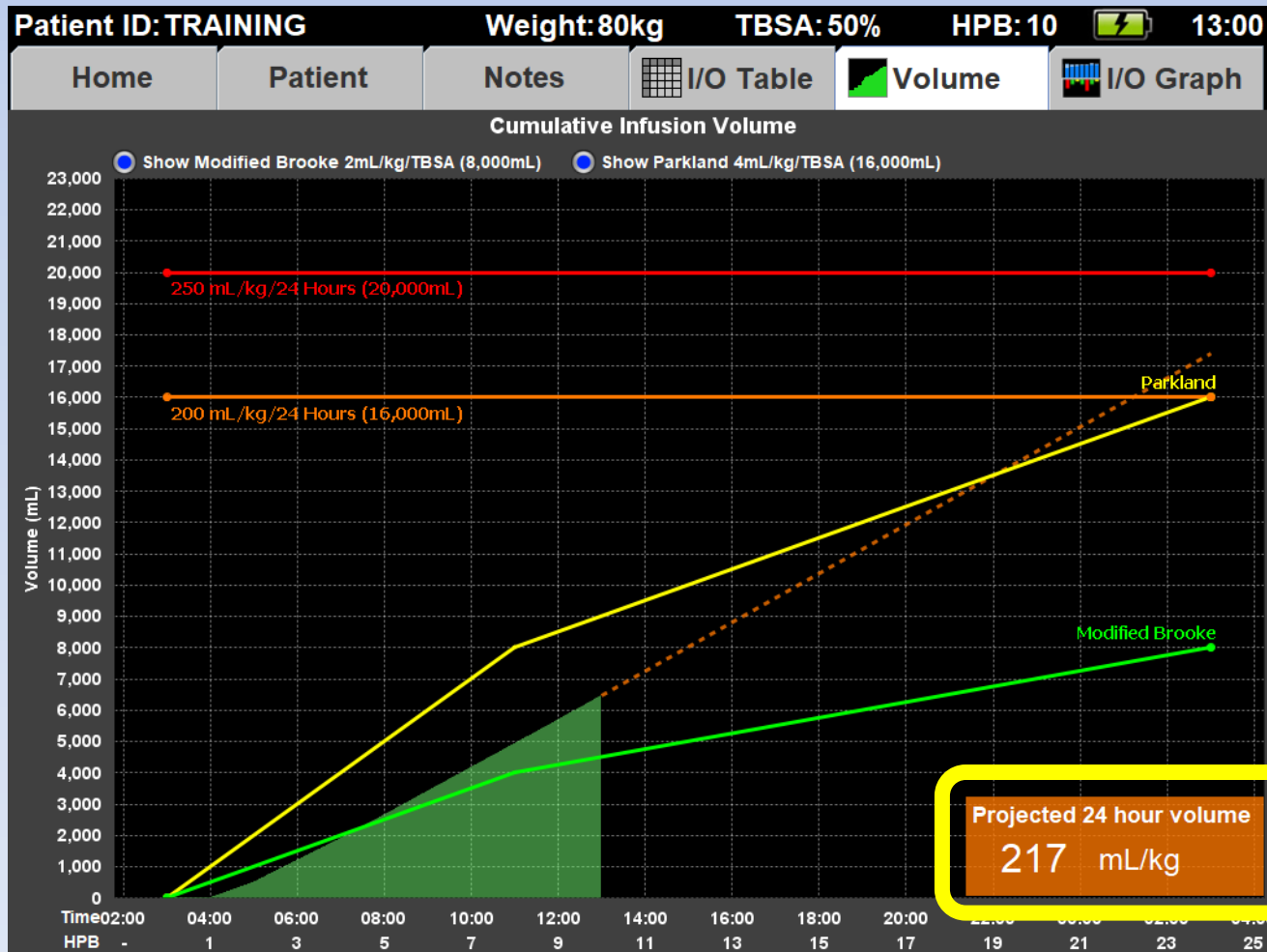
# The label will turn red if either:

- ml/kg is above 250, or
- ml/kg/TBSA is above 6.0



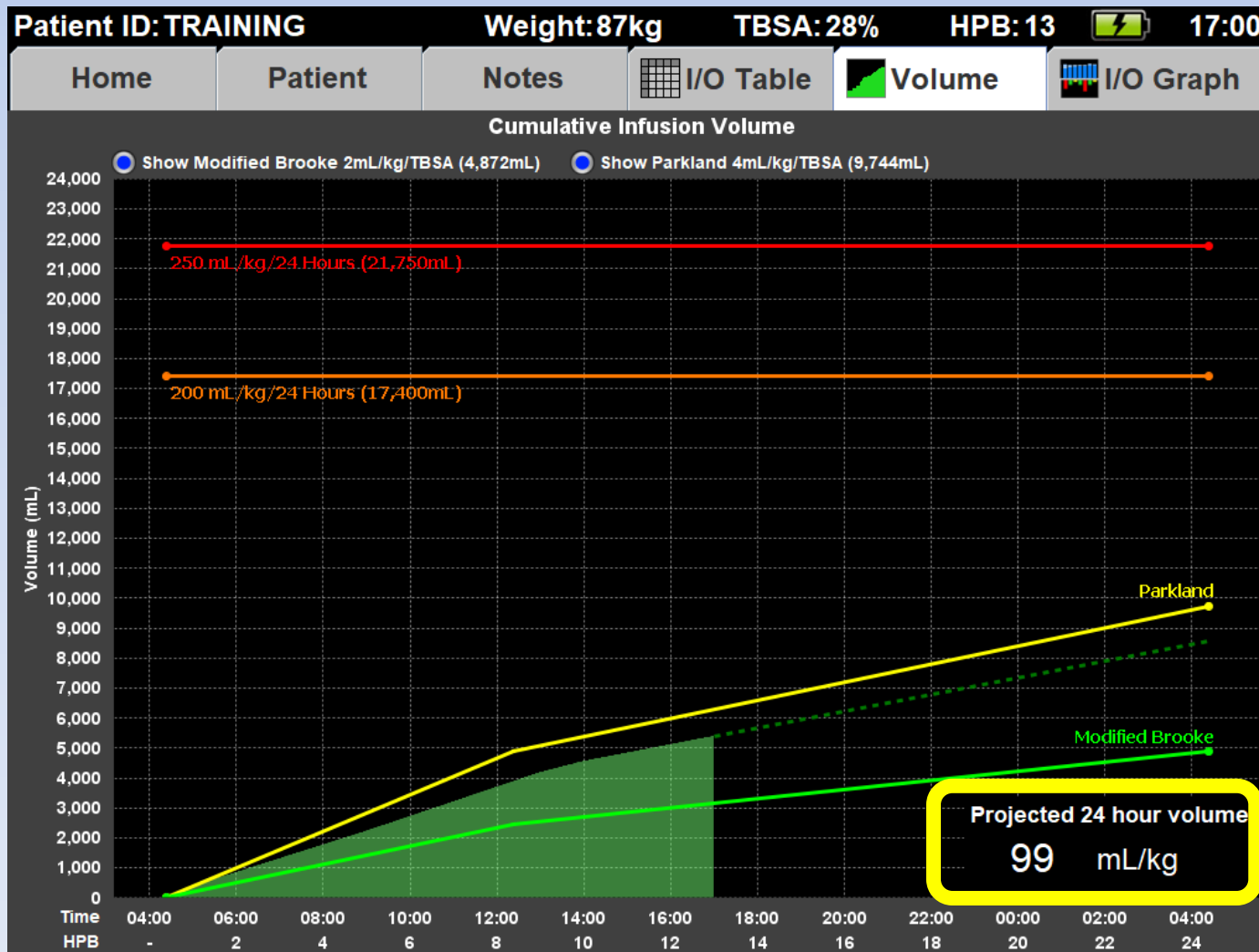
# The label will turn orange if:

- ml/kg is between 200 and 250
- ml/kg/TBSA is between 5.0 and 6.0

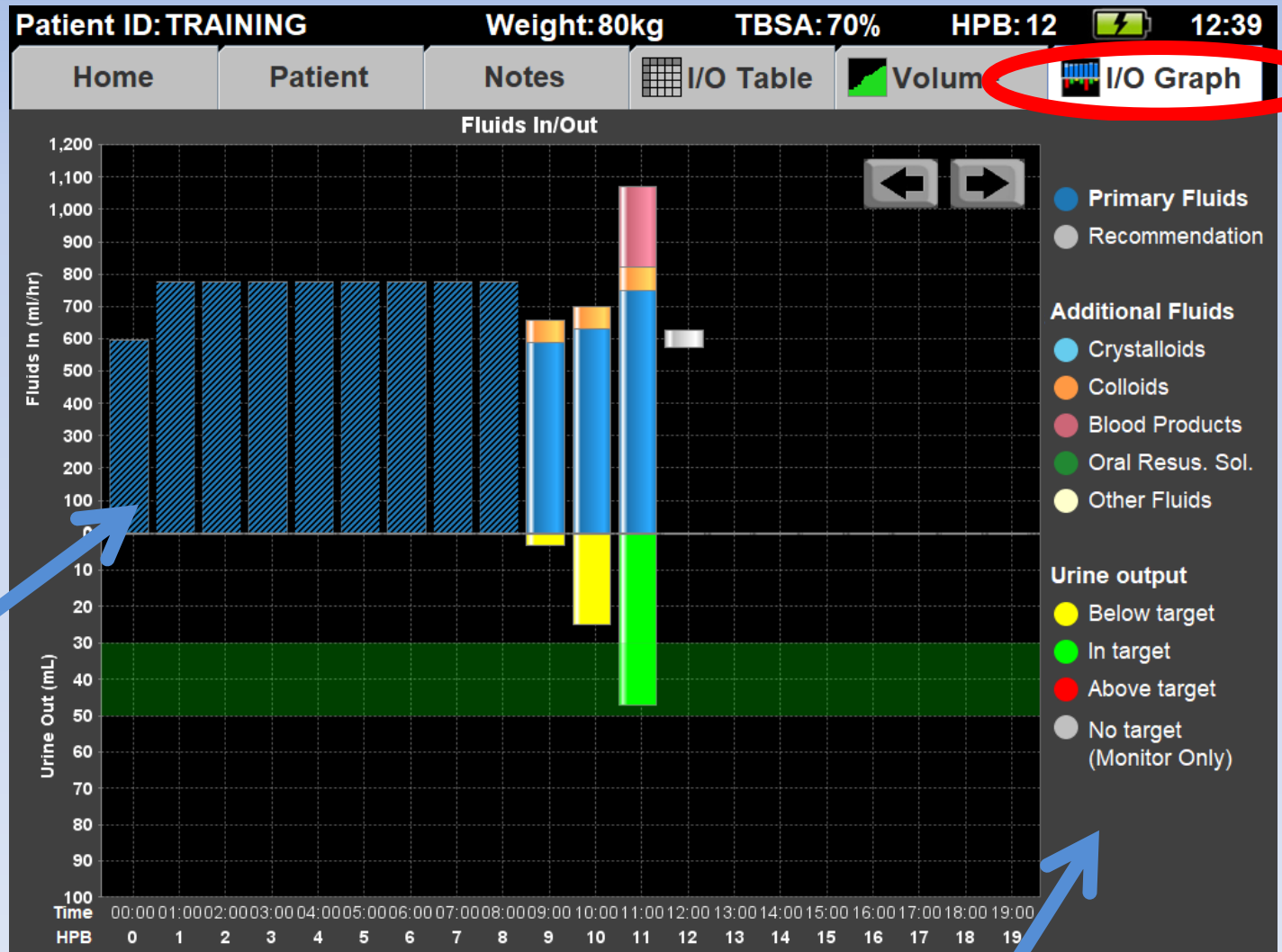


# The label will be black if both:

- ml/kg is less than 200
- ml/kg/TBSA is less than 5.0



# Press the "I/O Graph" tab



Pre-Burn Navigator fluids have transparent bars

Legend

# Home Screen

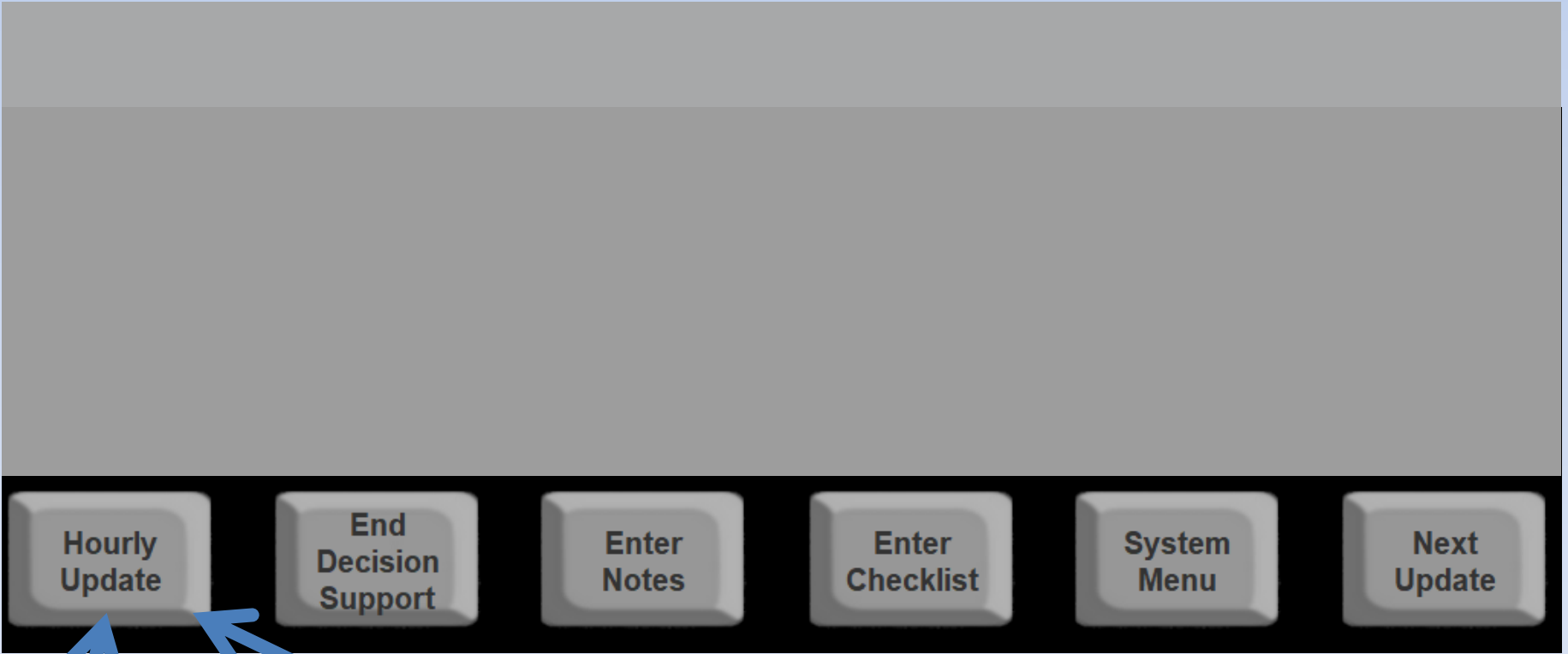
Press  
Home



Functional buttons  
are at the bottom



# Hourly Update Button



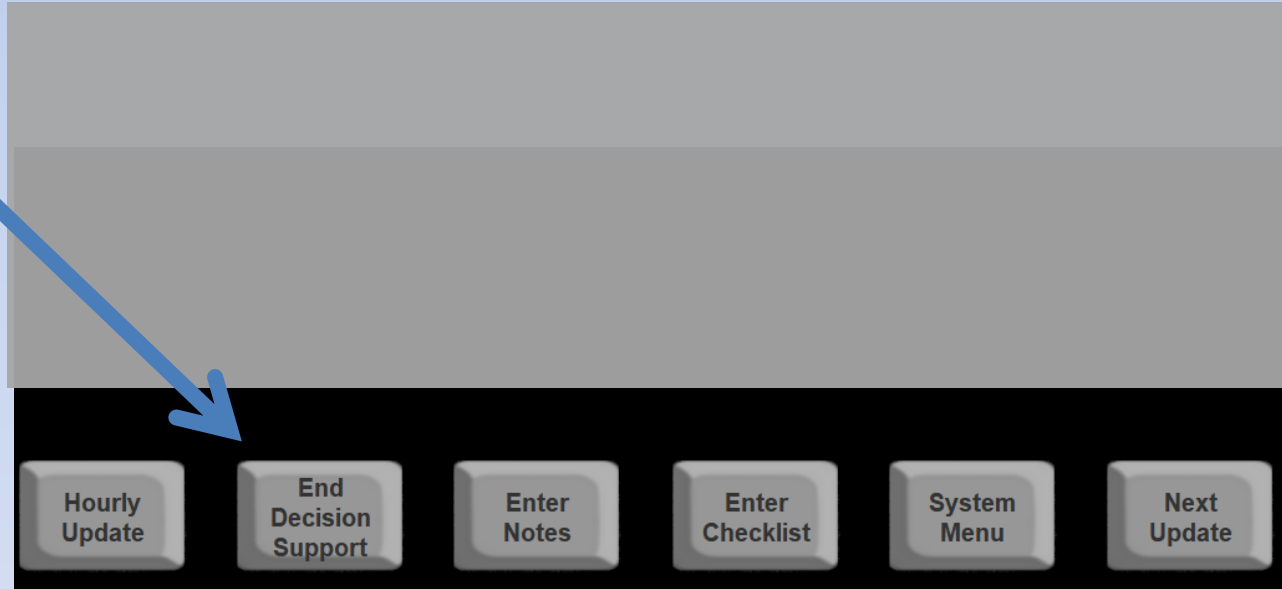
**Enter** new fluid update if it is time to do so

**Edit** within 10 minutes after an update ('grace period')



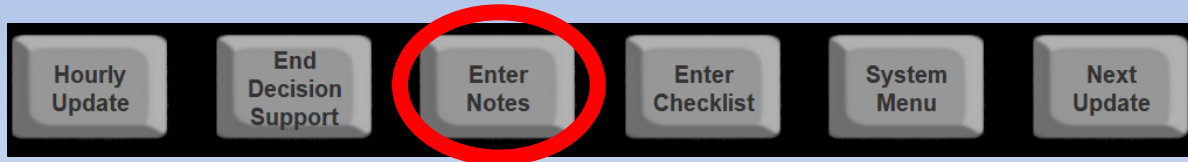
# End Decision Support Button

“End Decision Support”  
will close and inactive  
the patient file



**Careful!** Once you've ended decision support, you won't be able to add or edit any patient information!

# Enter Notes Button



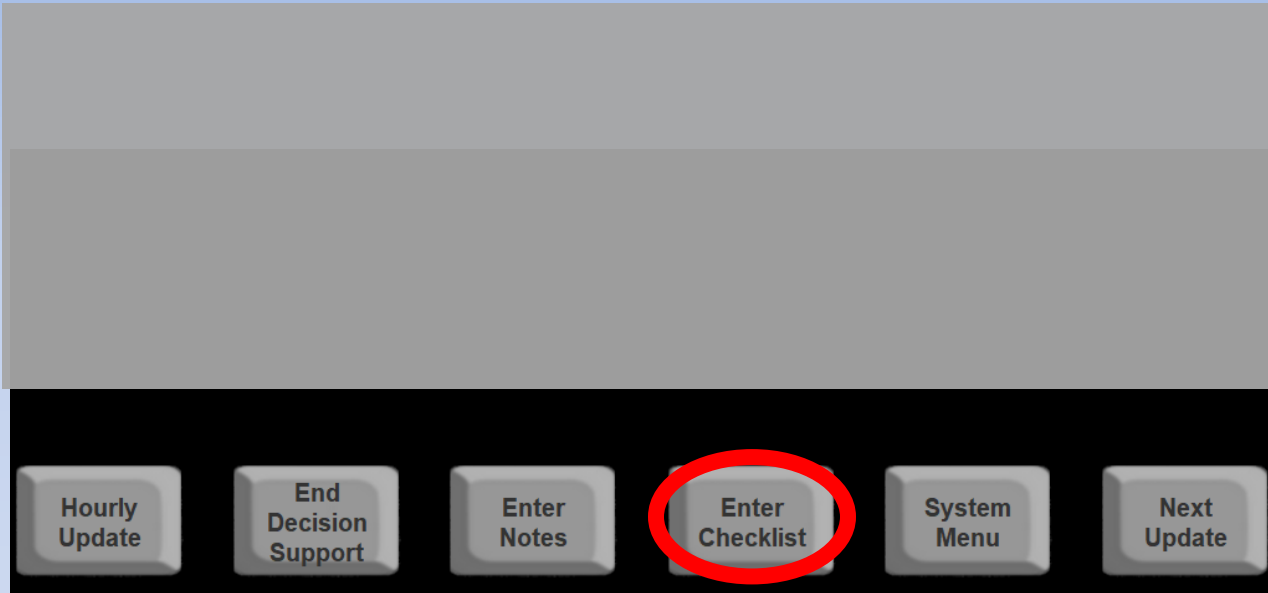
Press “Enter Notes”

## Notes

Inhalation Injury|

Press “Enter” to  
save the note

# Enter Checklist Button



**Checklist**

**Enter Vitals**

- ✓ Systolic BP  mmHg
- ✓ Diastolic BP  mmHg
- CVP  mmHg
- ✓ Heart rate  bpm

**Enter Bladder Pressure**

- Bladder pressure  mmHg

**Enter Labs**

- ScvO2  %
- ✓ Lactate  mg/dL
- Base excess  mEq/L
- ✓ Hemoglobin  g/dL

**Check Extremities**

- ✓ Elevate burned extremities
- ✓ Check for tightness

**Check Pulses**

- ✓ Left upper
- ✓ Right upper
- ✓ Left lower
- ✓ Right lower

“Enter Checklist” shows the checklist screen

We’ve already done one, so just continue for now!

# Home Screen

Patient ID: TRAINING    Weight: 80kg    TBSA: 70%    HPB: 12    12:40

Home    Patient    Notes    I/O Table    Volume    I/O Graph

**Current primary fluid**  
Lactated Ringer's

**Next update due**  
20 minutes

**Current infusion rate**  
750 mL/hr

**Projected 24 hour volume**  
3.3 mL/kg/TBSA

Hourly Update    End Decision Support    Enter Notes    Enter Checklist    System Menu    Next Update

You can  
change  
current  
rate here

# Press the “Patient” tab

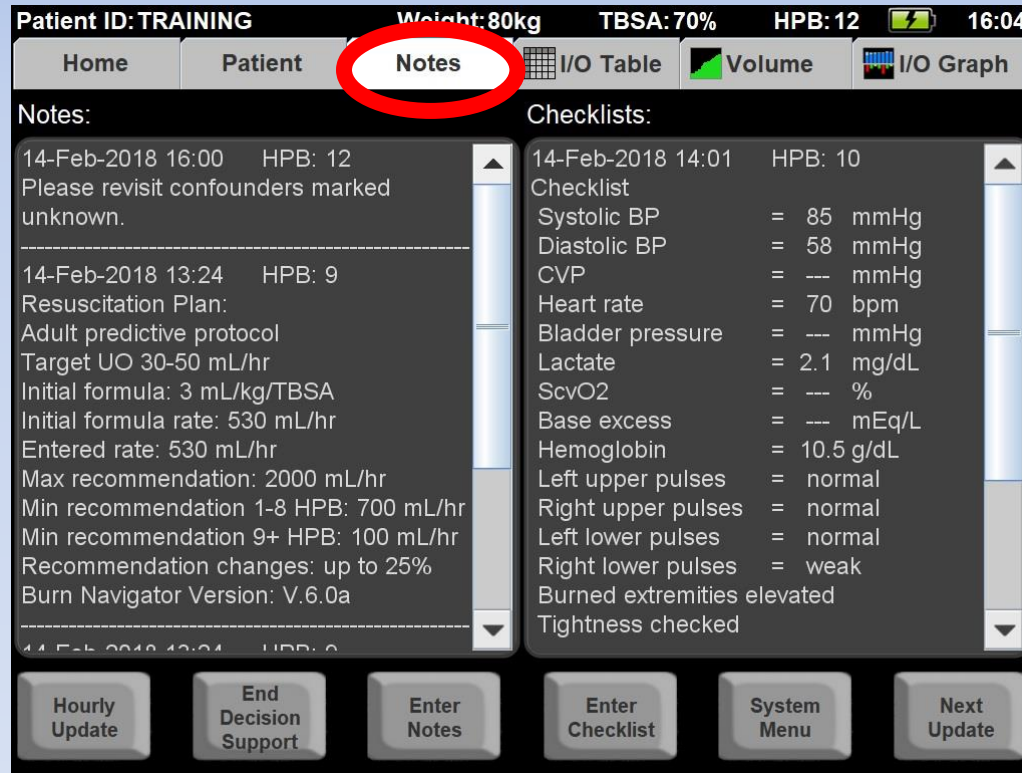
This screen lets you edit patient information

If you’ve mapped a more accurate TBSA, edit it here!

You can now edit the patient height.

The screenshot shows a mobile application interface for patient management. At the top, the status bar displays 'Patient ID: TRAINING', 'Weight: 80kg', 'TBSA: 70%', 'HPB: 12', a battery icon, and the time '12:46'. Below this is a navigation bar with tabs: 'Home', 'Patient' (circled in red), 'Notes', 'I/O Table', 'Volume', and 'I/O Graph'. The main content area is divided into two columns. The left column, titled 'Patient identification', contains fields for 'Patient identification' (value: TRAINING), 'Weight' (80 kg), 'Size of burn (TBSA):' (70 %), 'Height:' (--- in. and --- cm.), 'Confounders?' (Unknown), and 'Elapsed time since burn (HPB):' (12 hrs. and 32 mins.). The right column, titled 'Protocol: (view only)', contains fields for 'Adult predictive algorithm', 'Minimum rate after 8 HPB:' (100 mL/hr), 'Fluids given pre-Burn Navigator:' (7,000 mL), 'Urine output pre-Burn Navigator:' (--- mL), 'Burn time:' (00:14 21-Feb-2018), 'BurnNav started:' (09:14 21-Feb-2018), and 'BurnNav ended:' (---:-- -- --- ---). At the bottom, there is a row of six buttons: 'Hourly Update', 'End Decision Support', 'Enter Notes', 'Enter Checklist', 'System Menu', and 'Next Update'. Two red arrows point from the text on the left to the 'Size of burn (TBSA):' and 'Height:' fields.

# Press the “Notes” tab



Your notes and system generated notes are on the left

Checklists are on the right

The most recent notes and checklists are at the top  
**Scroll down to see older entries!**

Each note and checklist is time-stamped with hour post burn!

# Resuscitation Plan and Confounders are the first notes

The screenshot displays a medical software interface with the following elements:

- Header:** Patient ID: TRAINING, Weight: 80kg, TBSA: 70%, HPB: 12, 12:48
- Navigation:** Home, Patient, Notes (highlighted), I/O Table, Volume, I/O Graph
- Notes Section (circled in yellow):**
  - Adult predictive protocol
  - Target UO 30-50 mL/hr
  - Initial formula: 3 mL/kg/TBSA
  - Initial formula rate: 530 mL/hr
  - Entered rate: 530 mL/hr
  - Max recommendation: 2000 mL/hr
  - Min recommendation 1-8 HPB: 700 mL/hr
  - Min recommendation 9+ HPB: 100 mL/hr
  - Recommendation changes: up to 20%
  - Burn Navigator Version: V.6.0a

---

  - 21-Feb-2018 09:14 HPB: 9
  - Confounders
  - Gross myoglobinuria: No
  - High blood alcohol/EtOH: Unknown
  - Hyperglycemia: Unknown
  - End stage renal disease: Unknown
- Checklists Section:**
  - 21-Feb-2018 09:15 HPB: 9
  - Checklist
  - Systolic BP = 85 mmHg
  - Diastolic BP = 58 mmHg
  - CVP = --- mmHg
  - Heart rate = 70 bpm
  - Bladder pressure = --- mmHg
  - Lactate = 2.1 mg/dL
  - ScvO2 = --- %
  - Base excess = --- mEq/L
  - Hemoglobin = 10.5 g/dL
  - Left upper pulses = normal
  - Right upper pulses = weak
  - Left lower pulses = normal
  - Right lower pulses = weak
  - Burned extremities elevated
  - Tightness checked
- Bottom Buttons:** Hourly Update, End Decision Support, Enter Notes, Enter Checklist, System Menu, Next Update

Helpful for reviews, training & quality improvement

# Press the "I/O Table" tab

Patient ID: TRAINING      Weight: 75kg      TBSA: 35%      HPB: 18      16:05

Home    Patient    Notes    **I/O Table**    Volume    I/O Graph

Actual Times (Edit)     Hourly Averages

Legend:    - Pre-Burn Nav.    LR - Lactated Ringer's  
 \* - Edited Value    PL - Plasma-lyte  
 () - Projected Value    NS - Normal Saline

Hours Post Burn (HPB)	HPB0	HPB1	HPB2	HPB3	HPB4	HPB5	HPB6	HPB7	HPB8	HPB9
Clock Hour	22 - 23	23 - 0	0 - 1	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	6 - 7	7 - 8
Urinary Output (mL)	^4	^4	^4	^4	^4	^4	^4	^4	^4	^4
Urinary Output (mL/kg/hr)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Recommended Rate (mL/hr)										
Actual Primary Rate (mL/hr)	21	24	24	24	24	24	24	24	24	24
Actual Primary Volume (mL)	^21	^24	^24	^24	^24	^24	^24	^24	^24	^24
Lactated Ringer's (mL)	22	25	25	25	25	25	25	25	25	25
Total Secondary Fluids (mL)										
5% Albumin (mL)										
Oral Resus. Solution (mL)										
Total Fluids In (mL)	^21	^24	^24	^24	^24	^24	^24	^24	^24	^24
Total Cumulative Fluids (mL)	^21	^45	^69	^93	^117	^141	^165	^189	^213	^237
Hypotensive										
Hyperglycemic										
On Pressors										
On Diuretics										

\*Select Actual Times to edit columns

The I/O Table is a record of all fluid data



“Hourly Averages”  
 view shows you data  
 fitted to clock hours  
 e.g.:  
**13:00 – 14:00**  
**14:00 – 15:00**  
 etc.

Hours are labeled by  
 HPB:  
**Hour Post Burn 1**  
**Hour Post Burn 2**  
 etc.

Patient ID: TRAINING      Weight: 75kg      TBSA: 35%      HPB: 18      16:05

Home    Patient    Notes    I/O Table    Volume    I/O Graph

Actual Times (Edit)     Hourly Averages

Legend:    ^ - Pre-Burn Nav.    LR - Lactated Ringer's  
 \* - Edited Value    PL - Plasma-lyte  
 () - Projected Value    NS - Normal Saline

Hours Post Burn (HPB)	HPB0	HPB1	HPB2	HPB3	HPB4	HPB5	HPB6	HPB7	HPB8	HPB9
Clock Hour	22 - 23	23 - 0	0 - 1	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	6 - 7	7 - 8
Urinary Output (mL)	^4	^4	^4	^4	^4	^4	^4	^4	^4	^4
Urinary Output (mL/kg/hr)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Recommended Rate (mL/hr)										
Actual Primary Rate (mL/hr)	21	24	24	24	24	24	24	24	24	24
Actual Primary Volume (mL)	^21	^24	^24	^24	^24	^24	^24	^24	^24	^24
Lactated Ringer's (mL)	22	25	25	25	25	25	25	25	25	25
Total Secondary Fluids (mL)										
5% Albumin (mL)										
Oral Resus. Solution (mL)										
Total Fluids In (mL)	^21	^24	^24	^24	^24	^24	^24	^24	^24	^24
Total Cumulative Fluids (mL)	^21	^45	^69	^93	^117	^141	^165	^189	^213	^237
Hypotensive										
Hyperglycemic										
On Pressors										
On Diuretics										

\*Select Actual Times to edit columns

“Actual Times” view shows you the data when you entered it,

e.g.:  
**13:00**  
**14:05**  
**15:03**  
 etc.

The columns might not be 60 minutes!!

They could be:  
 65 min  
 57 min  
 60 min  
 etc.

Patient ID: TRAINING      Weight: 75kg      TBSA: 35%      HPB: 18      16:02

Home    Patient    Notes    I/O Table    Volume    I/O Graph


Actual Times (Edit)     Hourly Averages

Legend:    ^ - Pre-Burn Nav.    LR - Lactated Ringer's  
 \* - Edited Value    PL - Plasma-lyte  
 () - Projected Value    NS - Normal Saline

Actual Times	08:08	09:00	10:00	11:01	12:00	13:00	14:00	15:00	16:00	(17:00)
Urinary Output (mL)	^45	32	32	27	28	35	38	50	45	
Urinary Output (mL/kg/hr)	0.1	0.5	0.4	0.4	0.4	0.5	0.5	0.7	0.6	
Recommended Rate (mL/hr)		350	350	350	430	480	480	480	420	(380)
Actual Primary Rate (mL/hr)		350	350	350	430	480	480	480	420	
Actual Primary Volume (mL)	^250	303	350	355	422	480	480	480	420	
Lactated Ringer's (mL)	250	303	350	355	422	480	480	480	420	
Total Secondary Fluids (mL)						50	35	250		
5% Albumin (mL)						50	35			
Oral Resus. Solution (mL)								250		
Total Fluids In (mL)	^250									
Total Cumulative Fluids (mL)	^250									
Hypotensive								No	No	
Hyperglycemic								No	No	
On Pressors								No	No	
On Diuretics								No	No	

\*Select Actual Times to edit columns

**Patient ID: TRAINING**      **Weight: 80kg**      **TBSA: 47%**      **HPB: 10**

Home      Patient      Notes       **I/O Table**       Volume

**Actual Times (Edit)**       **Hourly Averages**

**Legend:**    ^ - Pre-Burn Nav.    LR - L  
                  \* - Edited Value    PL - P  
                  () - Projected Value    NS - N

Actual Times	07:12	08:00	09:00	10:21	11:15	12:00	14:00
Urinary Output (mL)		87	23	55	10	4	37
Urinary Output (mL/kg/hr)		1.4	0.3	0.5	0.1	0	5
Recommended Rate (mL/hr)		470	470	470	620	650	700
Actual Primary Rate (mL/hr)		470	470	500	565	700	500
Actual Primary Volume (mL)				5	509	525	500
Lactated Ringer's (mL)				5	509	525	500

UO from 10:21 to 11:15

Recommended rate (given at 10:21 for the upcoming hour)

Rate actually given (confirmed at 11:15)

New recommendation at 11:15 for next hour

1

2

3

4

# Safety Features

## Recommendations:

- Won't change more than the "cap"
- Max recommended: 2,000mL/hr or less

Patient ID: TRAINING    Weight: 80kg    TBSA: 70%    HPB: 11    13:01

### New Rate

Previous infusion rate: 630 mL/hr

Fluid type: Lactated Ringer's

Recommended rate: 750 mL/hr    19% ↑    New rate: 750 mL/hr    19% ↑

Back    Enter

**Minimum rates**  
(edit from  
Patient tab)

Patient ID: TRAINING    Weight: 79kg    TBSA: 70%    HPB: 9    16:15

### Minimum rate

**For first 8 hours post burn (HPB):**

2mL/kg/TBSA Formula    690 mL/hr

**After 8 HPB:**

4-2-1 Formula    119 mL/hr  
(4 mL/kg/hr for the first 10 kg) + (2 mL/kg/hr for the next 10 kg)  
+ (1 mL/kg/hr for weight above 20 kg)

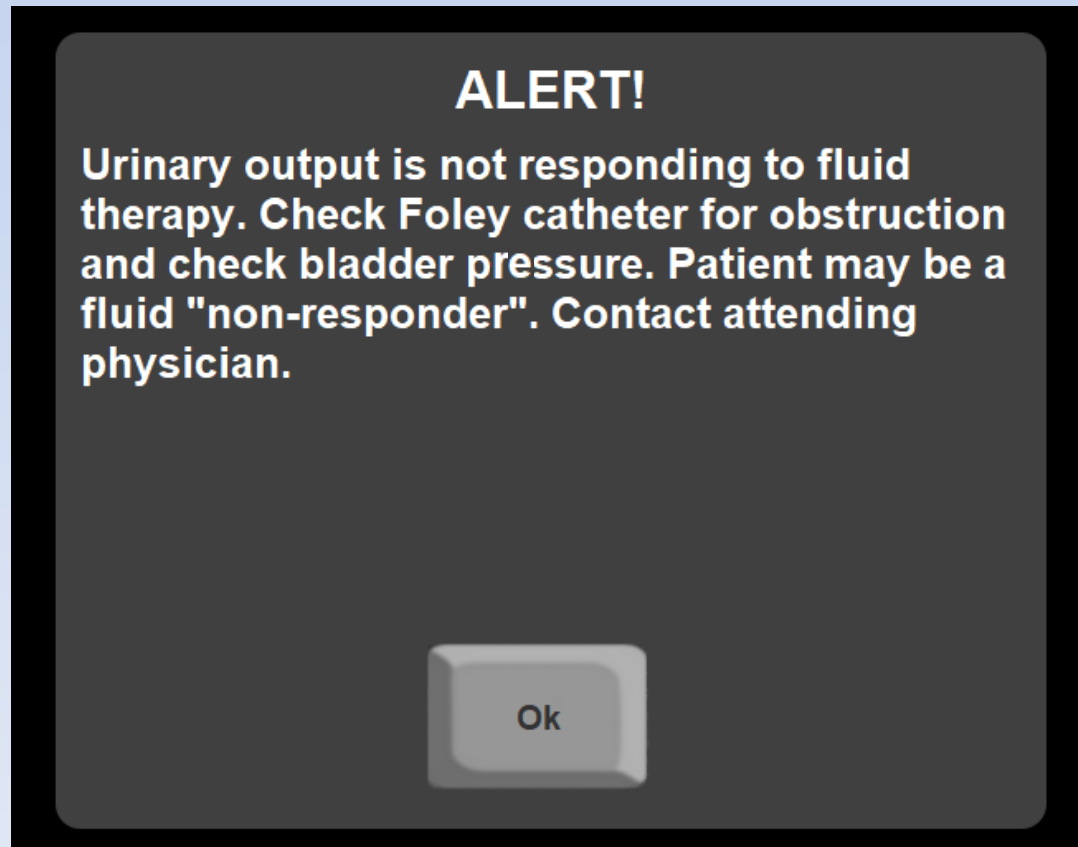
Manual    100 mL/hr

Cancel    Enter

# Alerts are a Safety Feature

## “Non-Responder” Alert

When patients aren't responding to fluid therapy



# Checklists are also a Safety Feature

Other indicators of **under-resuscitation** or **over-resuscitation**

The screenshot displays a medical software interface for a patient named TRAINING. The top status bar shows Patient ID: TRAINING, Weight: 80kg, TBSA: 70%, HPB: 14, and the time 13:34. Below the status bar are navigation tabs: Home, Patient, Notes, I/O Table, Volume, and I/O Graph. The main area is divided into two columns: Notes and Checklists. The Notes column contains three entries with dates and times, detailing urinary output issues and resuscitation plans. The Checklists column contains a checklist for 14-Mar-2018 09:00 with HPB: 10, listing various vital signs and physical exam findings. A red box highlights the Checklist section. At the bottom, there are six buttons: Hourly Update, End Decision Support, Enter Notes, Enter Checklist, System Menu, and Next Update.

Patient ID: TRAINING      Weight: 80kg      TBSA: 70%      HPB: 14      13:34

Home      Patient      Notes      I/O Table      Volume      I/O Graph

Notes:      Checklists:

14-Mar-2018 11:01      HPB: 12  
Urinary output is not responding to fluid therapy. Check Foley catheter for obstruction and check bladder pressure. Patient may be a fluid "non-responder". Contact attending physician.

14-Mar-2018 11:00      HPB: 12  
Please revisit confounders marked unknown.

14-Mar-2018 09:00      HPB: 10  
Resuscitation Plan:  
Adult predictive protocol  
Target UO 30-50 mL/hr  
Initial formula: 3 mL/kg/TBSA  
Initial formula rate: 530 mL/hr  
Entered rate: 530 mL/hr

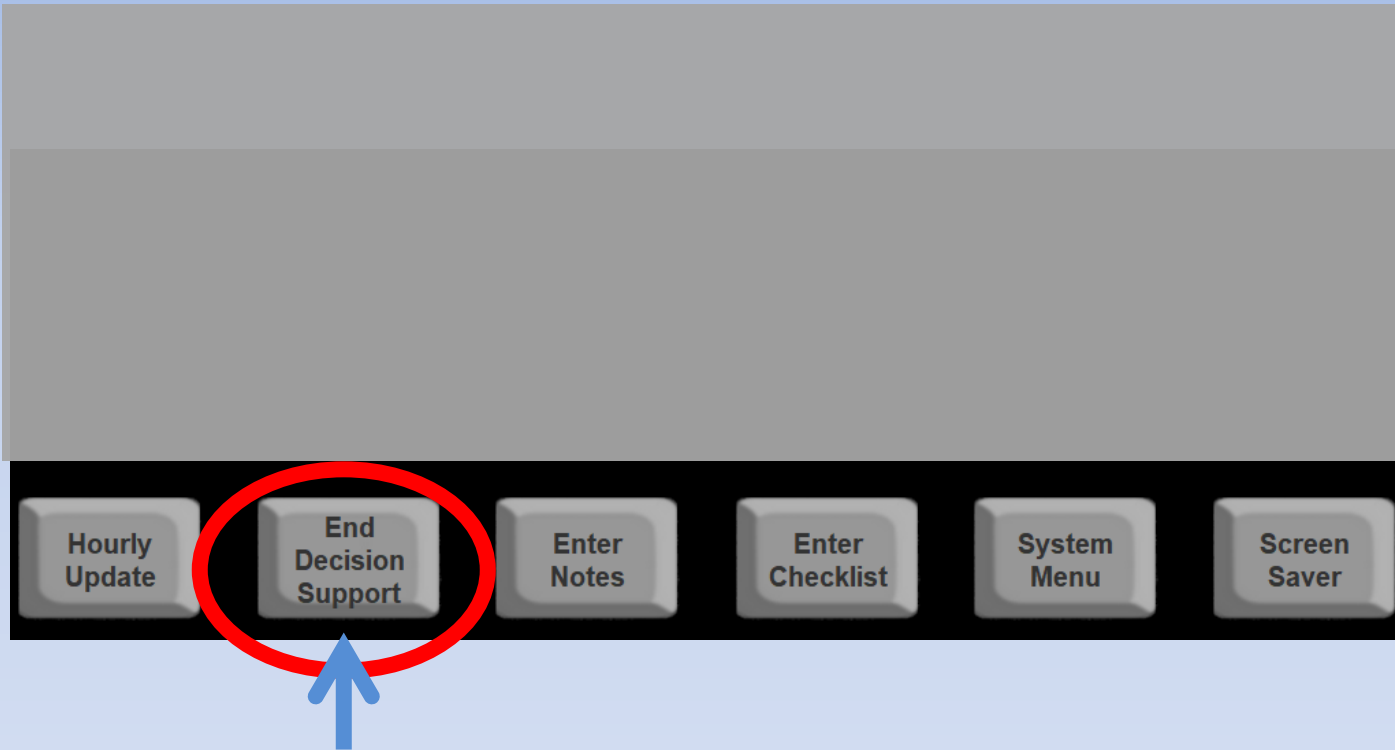
14-Mar-2018 09:00      HPB: 10  
Checklist  
Systolic BP = 85 mmHg  
Diastolic BP = 58 mmHg  
CVP = --- mmHg  
Heart rate = 70 bpm  
Bladder pressure = --- mmHg  
Lactate = 2.1 mg/dL  
ScvO2 = --- %  
Base excess = --- mEq/L  
Hemoglobin = 10.5 g/dL  
Left upper pulses = normal  
Right upper pulses = weak  
Left lower pulses = normal  
Right lower pulses = weak  
Burned extremities elevated  
Tightness checked

Hourly Update      End Decision Support      Enter Notes      Enter Checklist      System Menu      Next Update

# Keep in Mind!

Recommendations are only recommendations!

Understand the whole clinical picture,  
communicate with the attending physician, and  
do what's best for the patient



When resuscitation  
is over, press  
**“End Decision Support”**



# End Decision Support Rationale

Please select a rationale for ending decision support.

- Met resuscitation end points
- Physician direction
- Comfort measures
- Patient death
- Unknown

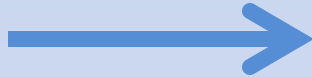
Confirm Cancel

Your selection will be added to the Notes

# FAQs

## What if I change the pump rate in the middle of the hour?

If you change the rate from the HOME screen ...



Patient ID: TRAINING    Weight: 80kg    TBSA: 80%    HPB: 15    16:30

Home    Patient    Notes    I/O Table    Volume    I/O Graph

**Current primary fluid**  
Lactated Ringer's

**Next update due**  
30 minutes

**Current infusion rate**  
500 mL/hr

**Projected 24 hour volume**  
2.5 mL/kg/TBSA

Patient ID: TRAINING    Weight: 80kg    TBSA: 80%    HPB: 16    17:01

**Fluids Given**

From: 16:00    To: 17:01    61 mins.

Primary fluid was:  
Lactated Ringer's

Infusion rate:    Infusion volume:  
745 mL/hr    758 mL

Back    Next

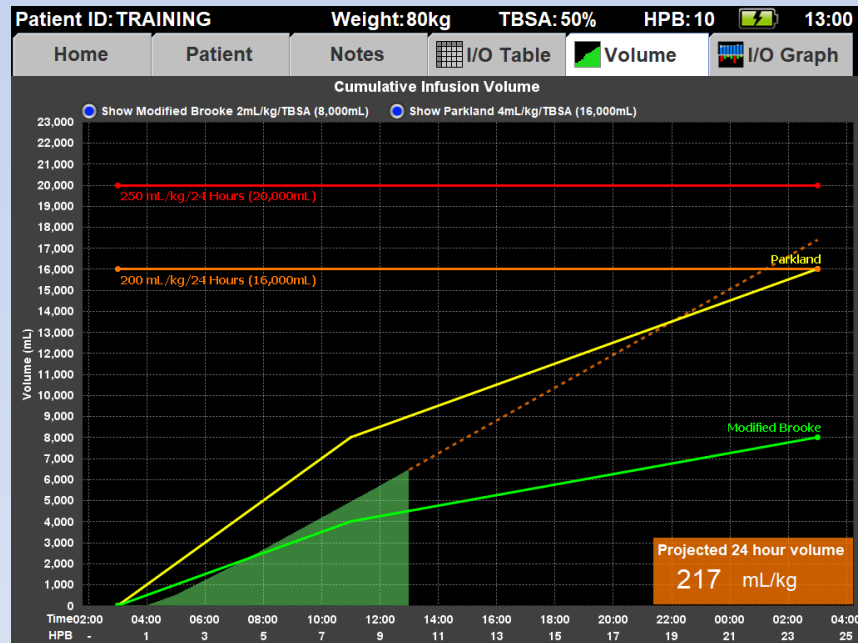


...the average rate and volume are calculated for that hour for you in the next update!

# Arcos™

## Burn Navigator®

### Questions?



Arcos customer support:

877.542.8025

[support@arcosmedical.com](mailto:support@arcosmedical.com)