How to Set Up Continuous EEG (CEEG)

OBTAIN SUPPLIES

1. ***EEG module (yellow)***
2. EEG cable with wires
3. NuPrep™ cream and a face cloth
4. Paediatric electrodes (use new package)

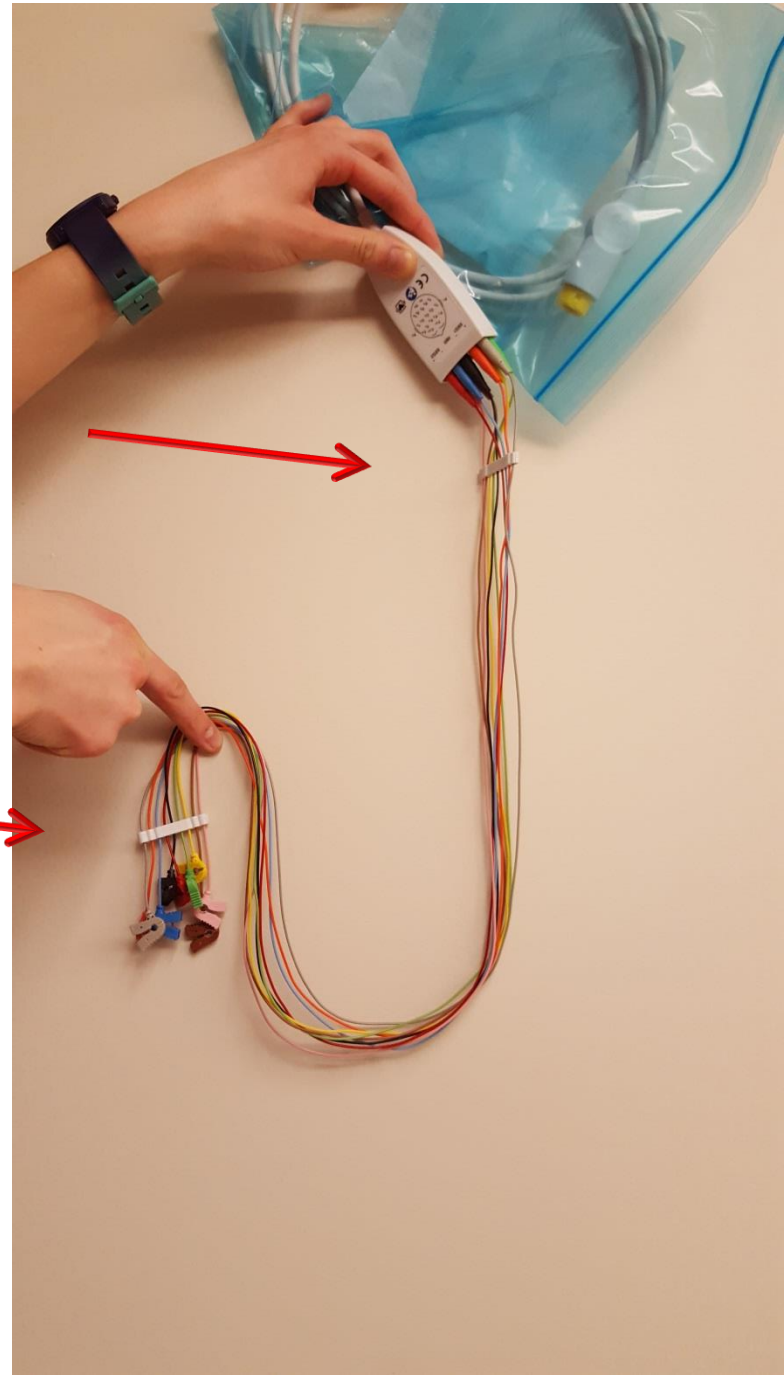
Storing EEG Cables

All supplies including electrodes, NuPrep, module and leads are in Bay 1 supply room.

After use, slide the two white bars at each end of the electrodes as close to the hub and clips as possible. Let cleaners know to return these bars to this position if they are moved during cleaning.

This will keep the leads from becoming tangled and nurses from losing their minds.

Store on hooks in the South West corner of the Bay 1 supply room (loop the trunk cable on the large hook and the EEG leads on the small hooks).



How to Setting Up Continuous EEG

OBTAIN SUPPLIES

1. EEG module (yellow)
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How to Setting Up Continuous EEG

OBTAIN SUPPLIES

1. EEG module (yellow)
2. EEG cable with wires
3. NuPrep™ cream and a face cloth
4. ***Paediatric electrodes (new package)***
   repositionable electrodes 2660-3

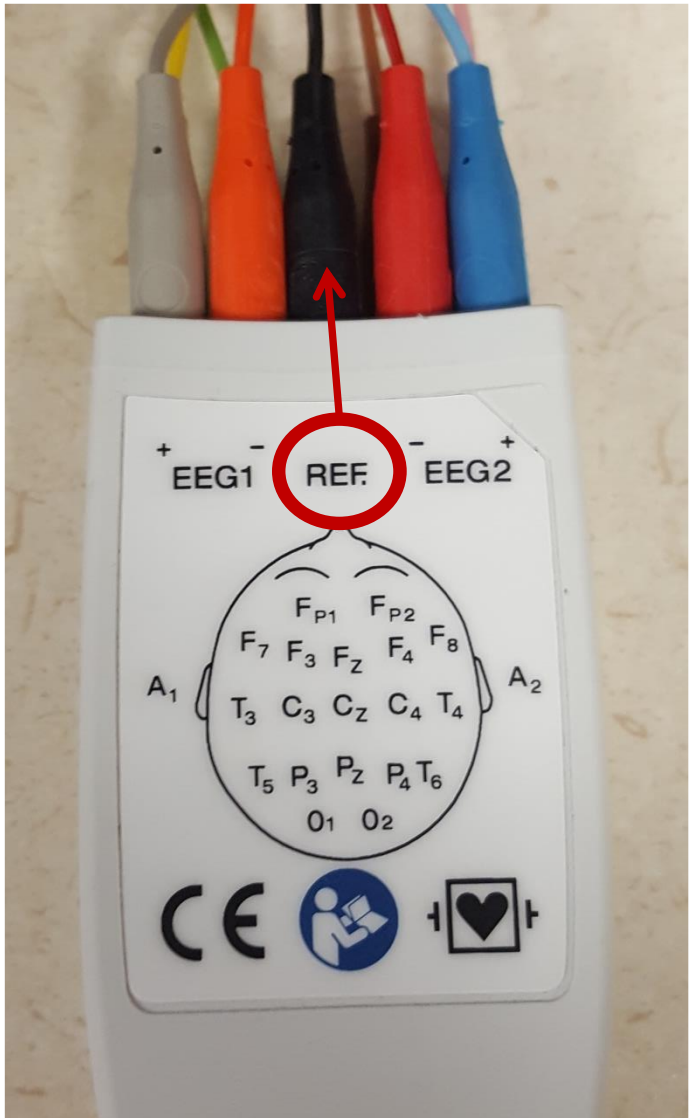
Prepare Skin

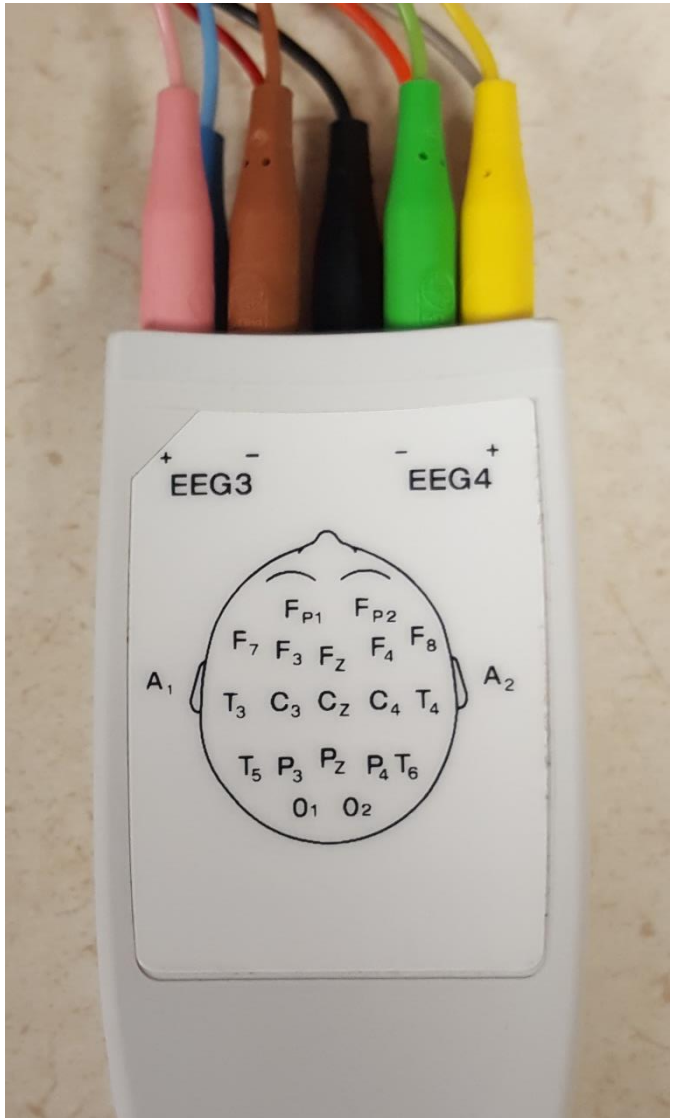
1. Wet a washcloth with warm water **(no soap, cleanser or alcohol)** and scrub skin along hairline and behind ears
2. Rub vigorously with a dry washcloth or towel (to remove residue and roughen epithelial cells)
3. Rub a small amount of Nuprep* into the skin on all areas where electrodes will be applied
4. Remove all traces of Nuprep with a dry washcloth

*Mild abrasive gel that reduces impedance, improves conductivity and reduces artifact

Confirm that the Color Sequence Matches

The black reference electrode is on this side.





Apply Electrodes (diagram next page)

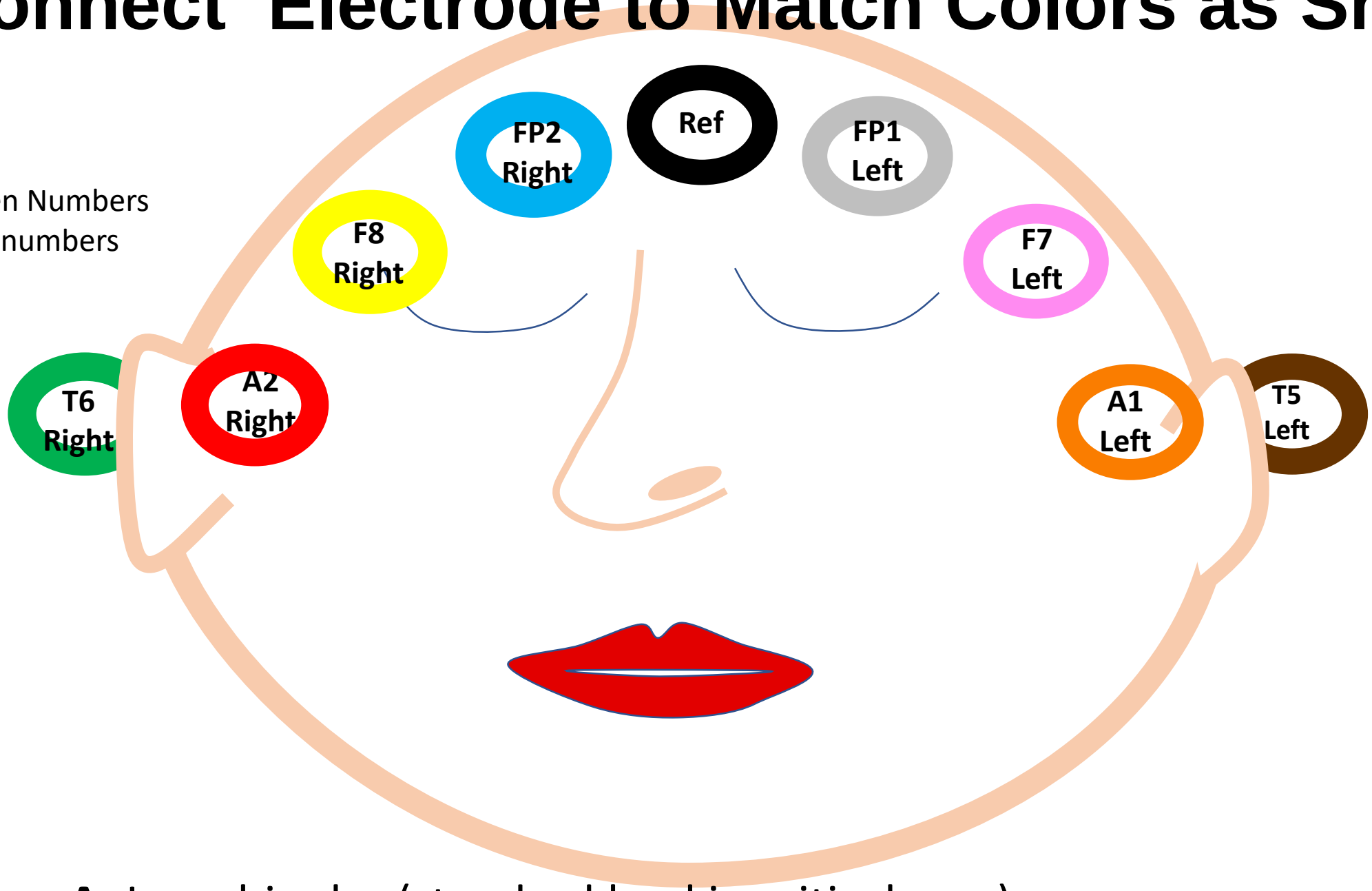
- Apply electrodes just below hair line (sub-hairline); leave enough space to ensure electrode is not in patient's hair which will reduce contact
- Avoid pressing on the centre of the electrode (this can cause a loss of conducting gel)
    1. Place one sub-hairline electrode in the centre of the sub-hairline
    2. Place one electrode in front of each ear
    3. Place one electrode over each temple
    4. Place one electrode between the centre electrode and the temple electrode on each side
    5. Place one electrode behind each ear

Electrode Placement

Identify the CEEG Lead Colors

Connect Electrode to Match Colors as Shown

Right: Even Numbers
Left: Odd numbers



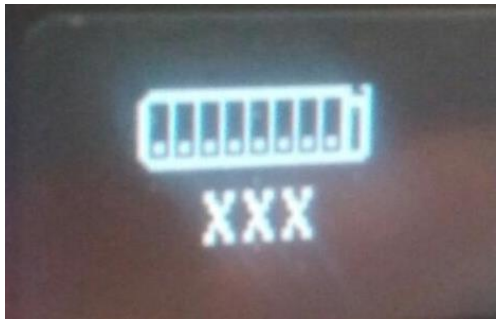
Montage A: Long bipolar (standard lead in critical care)

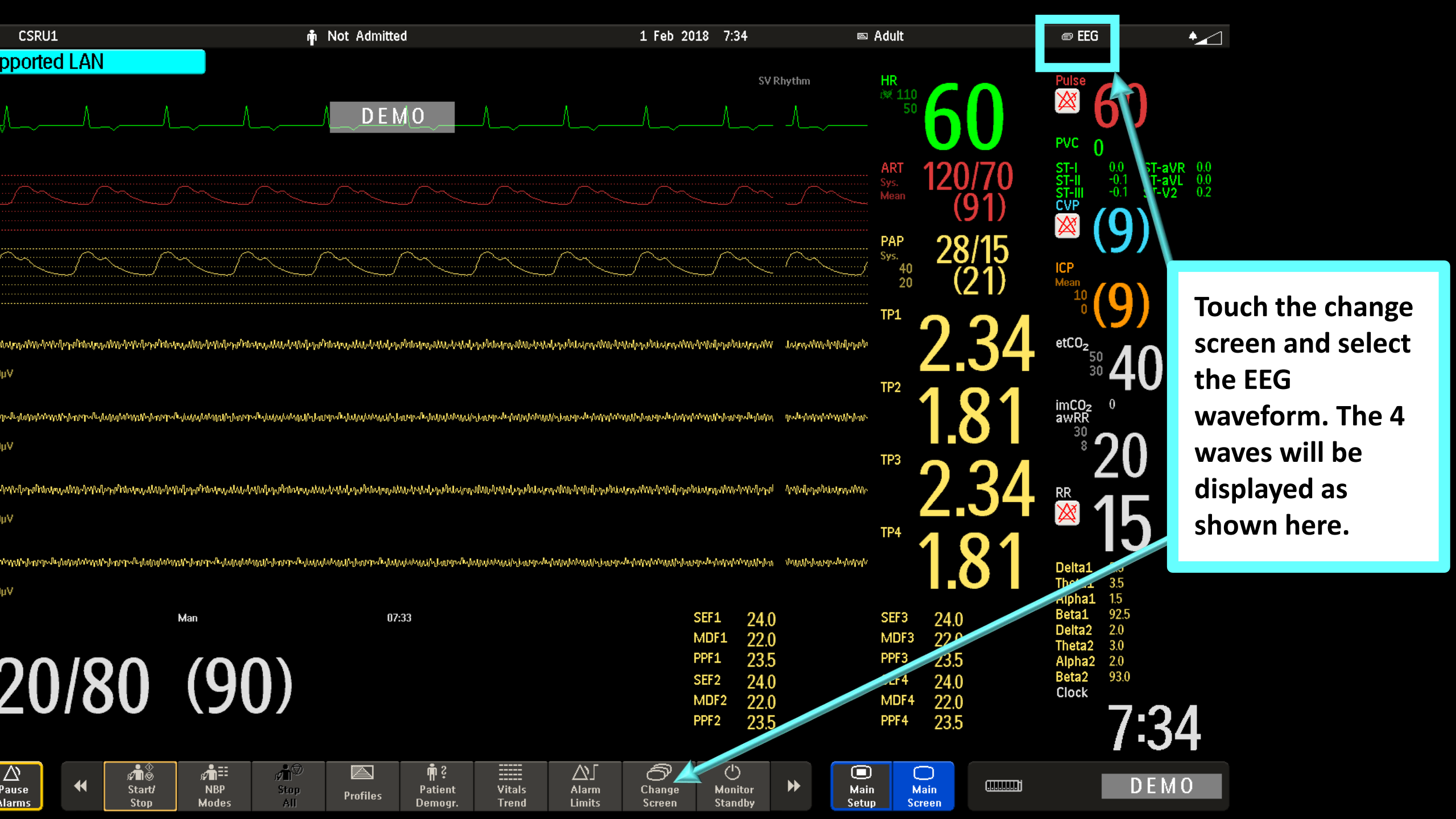
Monitoring Should Begin Immediately

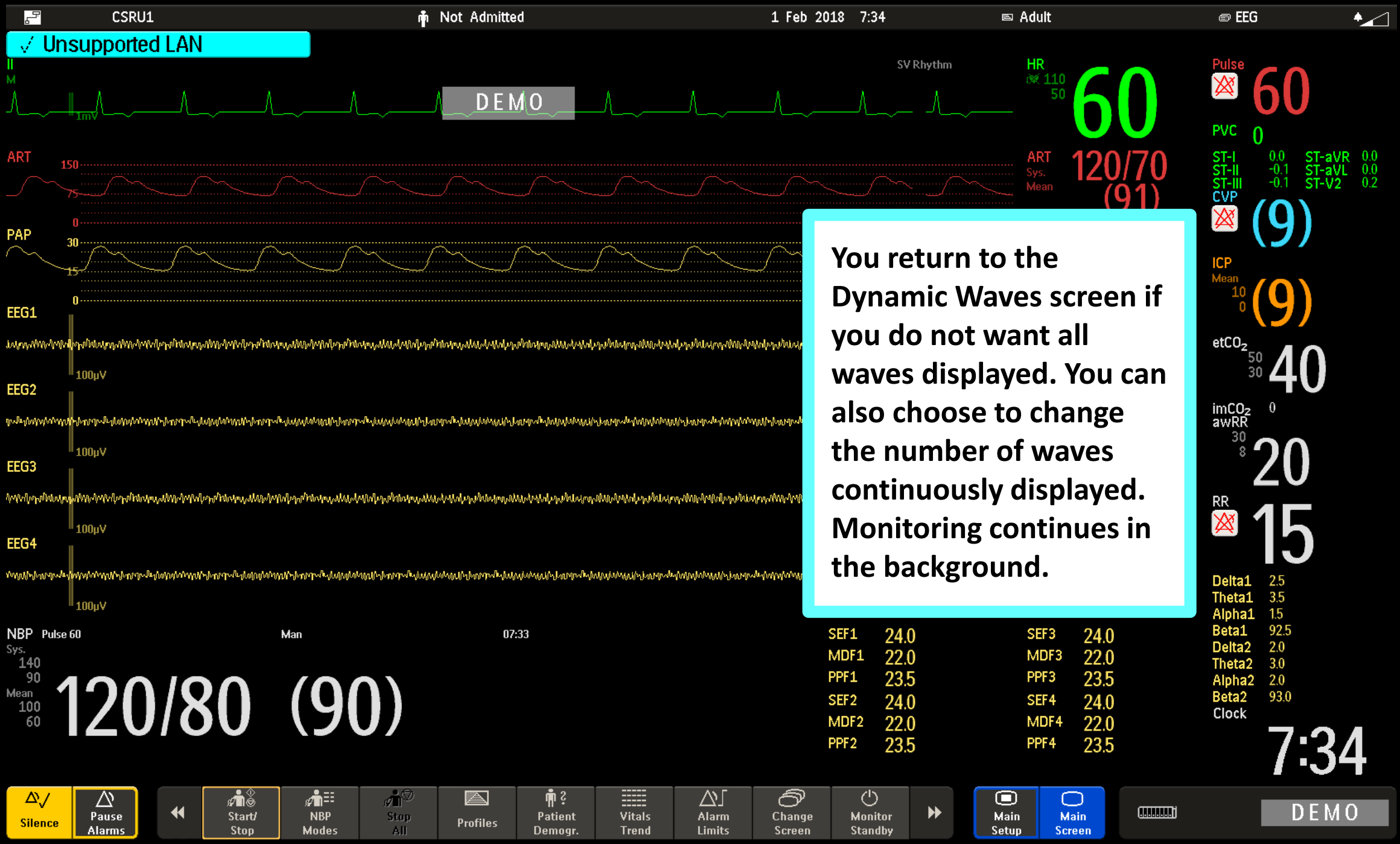
Monitoring should begin immediately.

If monitoring doesn’t begin immediately, make sure that the module is pushed in a connecting to the back of the rack.

If monitoring still doesn’t begin, press on the “xylophone” key at the bottom right of the screen an enable the EEG module.

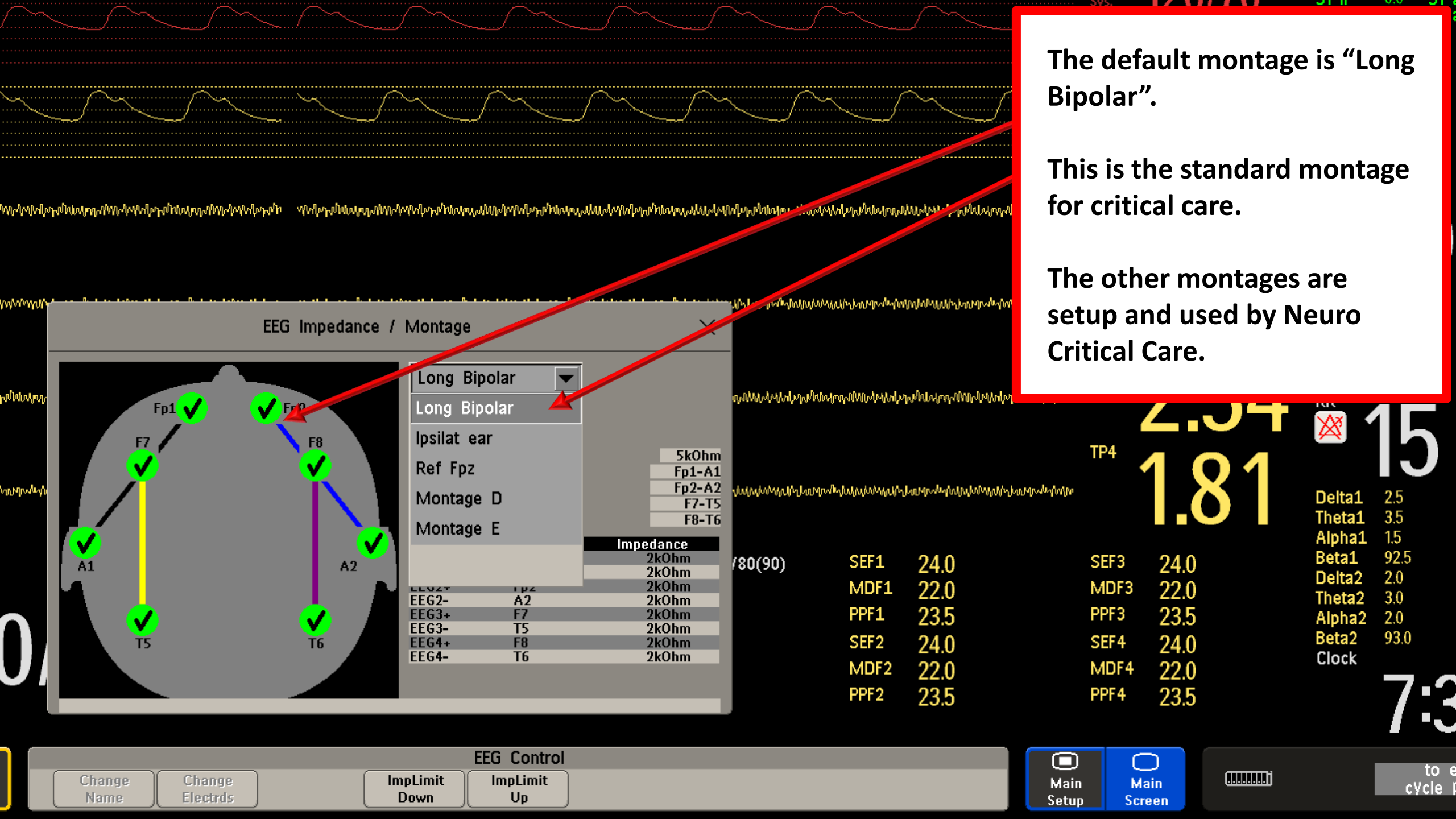



CSRU1
Not Admitted
1 Feb 2018 7:34
Adult
EEG
pported LAN
SV Rhythm
DEMO
HR
110
50
60
Pulse
60
PVC 0
ART
Sys.
Mean
120/70
(91)
ST-I 0.0
ST-II -0.1
ST-III -0.1
ST-aVR 0.0
ST-aVL 0.0
ST-V2 0.2
CVP
(9)
PAP
Sys.
40
20
28/15
(21)
ICP
Mean
10
0
(9)
TP1
2.34
TP2
1.81
TP3
2.34
TP4
1.81
etCO2
50
30
40
imCO2 0
awRR
30
8
20
RR
15
Delta1
Theta1 3.5
Alpha1 1.5
Beta1 92.5
Delta2 2.0
Theta2 3.0
Alpha2 2.0
Beta2 93.0
Clock
7:34
Man
07:33
20/80 (90)
SEF1 24.0
MDF1 22.0
PPF1 23.5
SEF2 24.0
MDF2 22.0
PPF2 23.5
SEF3 24.0
MDF3 22.0
PPF3 23.5
SEF4 24.0
MDF4 22.0
PPF4 23.5
Touch the change screen and select the EEG waveform. The 4 waves will be displayed as shown here.
Pause Alarms
Start/ Stop
NBP Modes
Stop All
Profiles
Patient Demogr.
Vitals Trend
Alarm Limits
Change Screen
Monitor Standby
Main Setup
Main Screen
DEMO

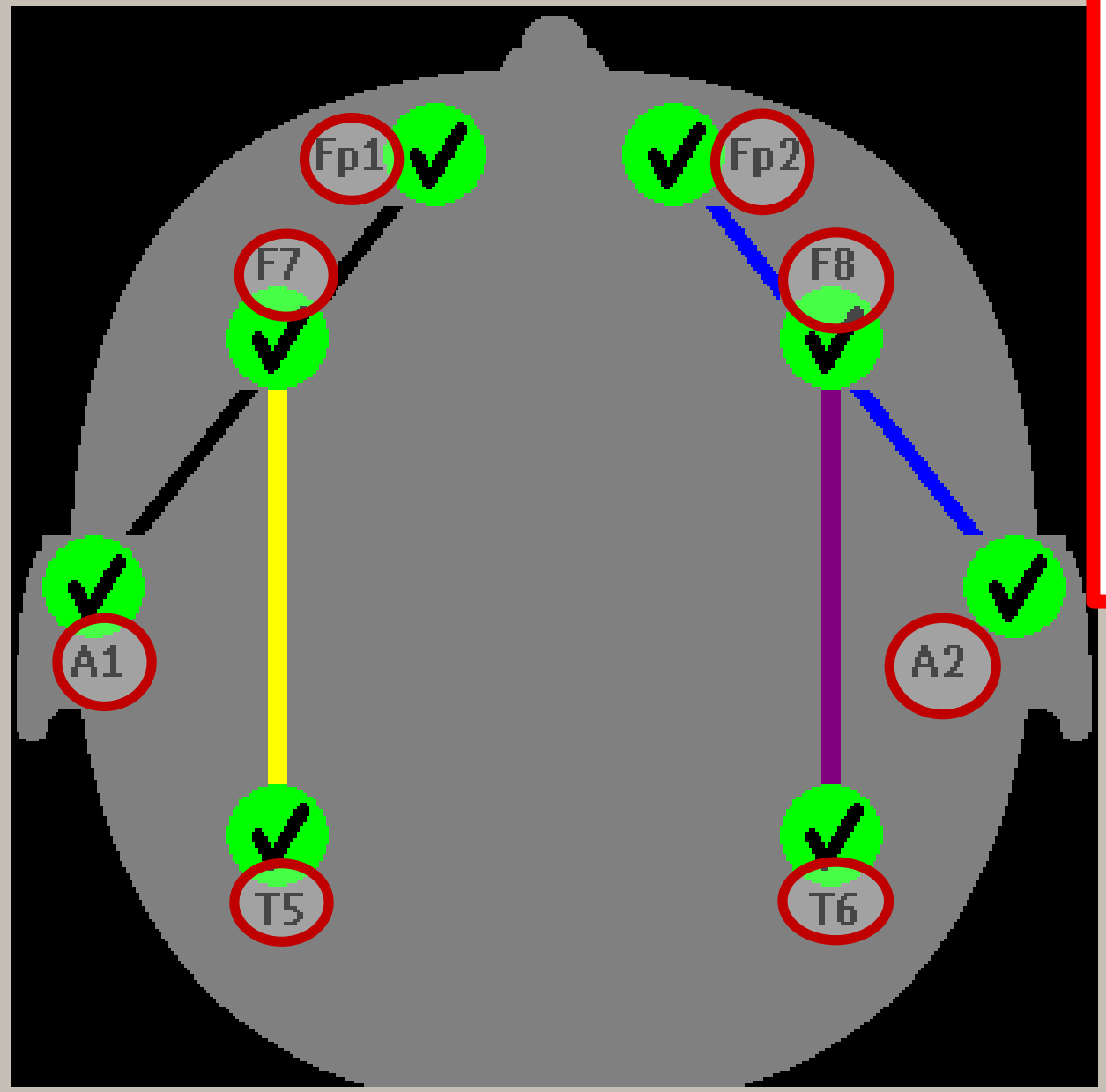

CSRU1
Not Admitted
1 Feb 2018 7:34
Adult
EEG
Unsupported LAN
II
M
1mV
SV Rhythm
DEMO
HR
110
50
60
Pulse
60
PVC
0
ST-I 0.0
ST-II -0.1
ST-III -0.1
ST-aVR 0.0
ST-aVL 0.0
ST-V2 0.2
CVP
(9)
ART
150
75
0
ART
Sys.
Mean
120/70
(91)
PAP
30
15
0
ICP
Mean
10
0
(9)
EEG1
100µV
EEG2
100µV
EEG3
100µV
EEG4
100µV
etCO2
50
30
40
imCO2
awRR
0
30
8
20
RR
15
You return to the Dynamic Waves screen if you do not want all waves displayed. You can also choose to change the number of waves continuously displayed. Monitoring continues in the background.
Delta1 2.5
Theta1 3.5
Alpha1 1.5
Beta1 92.5
Delta2 2.0
Theta2 3.0
Alpha2 2.0
Beta2 93.0
Clock
7:34
NBP Pulse 60
Man
07:33
Sys.
140
90
Mean
100
60
120/80 (90)
SEF1 24.0
MDF1 22.0
PPF1 23.5
SEF2 24.0
MDF2 22.0
PPF2 23.5
SEF3 24.0
MDF3 22.0
PPF3 23.5
SEF4 24.0
MDF4 22.0
PPF4 23.5
Silence
Pause Alarms
Start/ Stop
NBP Modes
Stop All
Profiles
Patient Demogr.
Vitals Trend
Alarm Limits
Change Screen
Monitor Standby
Main Setup
Main Screen
DEMO

From the smart keys at the bottom, select the next page until you find the EEG setup menu.

The monitor automatically detects whether there are 2 (4 montage) or 4 wave (8 montage).


The default montage is “Long Bipolar”.
This is the standard montage for critical care.
The other montages are setup and used by Neuro Critical Care.
EEG Impedance / Montage
Long Bipolar
Long Bipolar
Ipsilat ear
Ref Fpz
Montage D
Montage E
Fp1
F7
F8
A1
A2
T5
T6
5kOhm
Fp1-A1
Fp2-A2
F7-T5
F8-T6
Impedance
2kOhm
EEG2- A2 2kOhm
EEG3+ F7 2kOhm
EEG3- T5 2kOhm
EEG4+ F8 2kOhm
EEG4- T6 2kOhm
TP4
1.81
15
Delta1 2.5
Theta1 3.5
Alpha1 1.5
Beta1 92.5
Delta2 2.0
Theta2 3.0
Alpha2 2.0
Beta2 93.0
Clock
SEF1 24.0
MDF1 22.0
PPF1 23.5
SEF2 24.0
MDF2 22.0
PPF2 23.5
SEF3 24.0
MDF3 22.0
PPF3 23.5
SEF4 24.0
MDF4 22.0
PPF4 23.5
EEG Control
Change Name
Change Electrds
ImpLimit Down
ImpLimit Up
Main Setup
Main Screen

EEG Impedance /



Electrode codes are as follows:

Even numbers right side

Odd numbers left side

F (frontal)

P (parietal)

Fp (frontal polar)

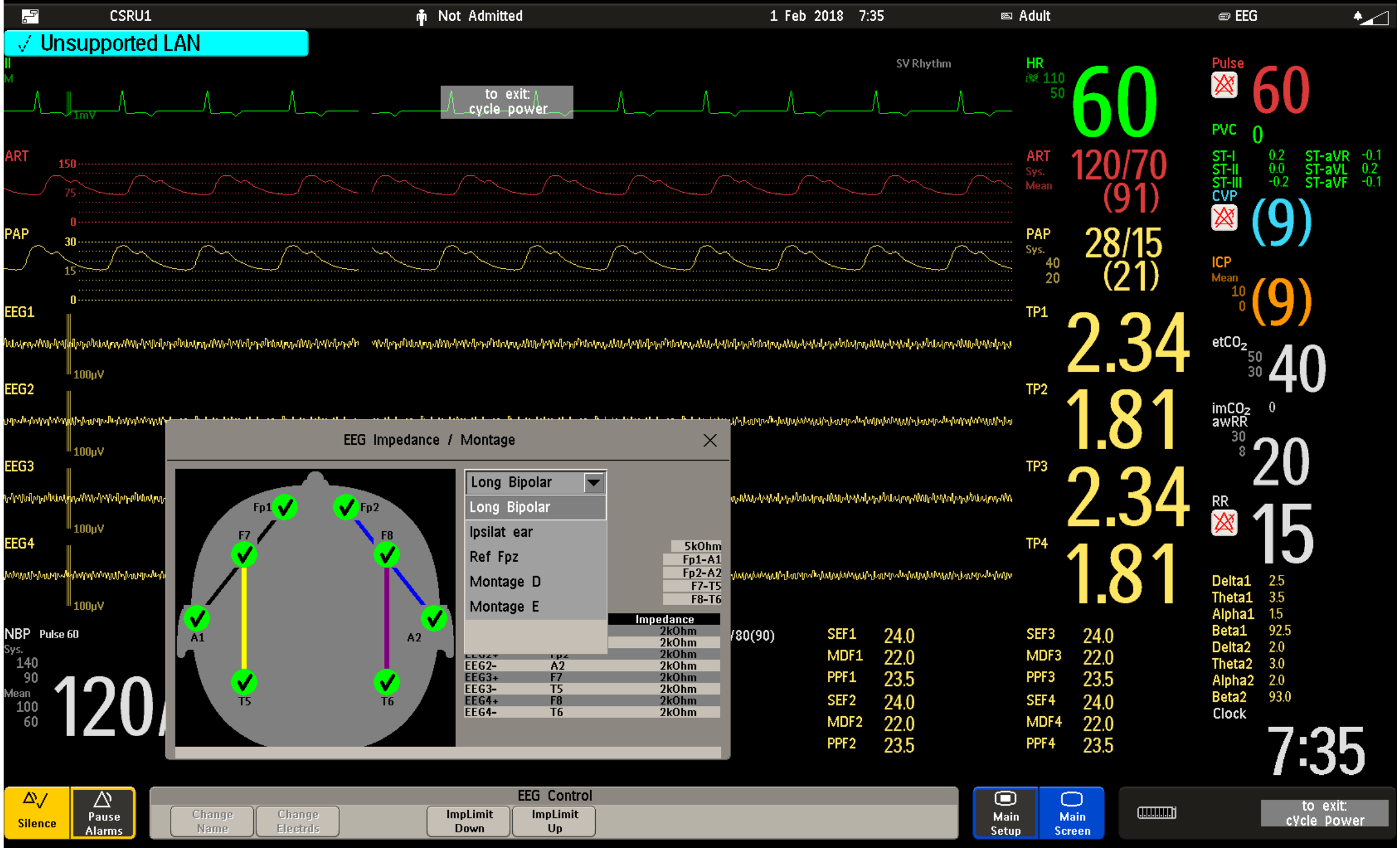
T (temporal)

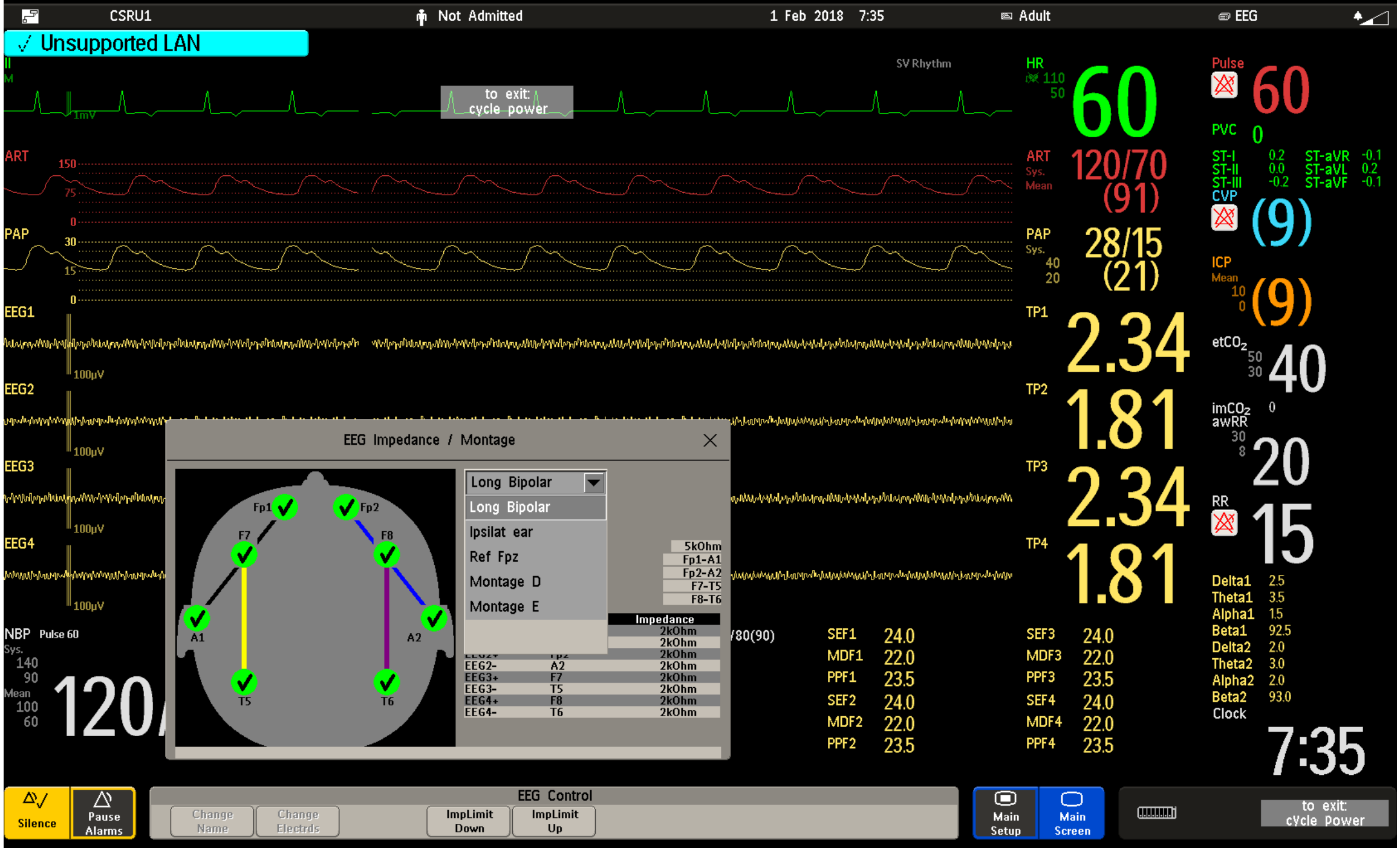
O (occipital)

A (“zero” or electrode on midline)

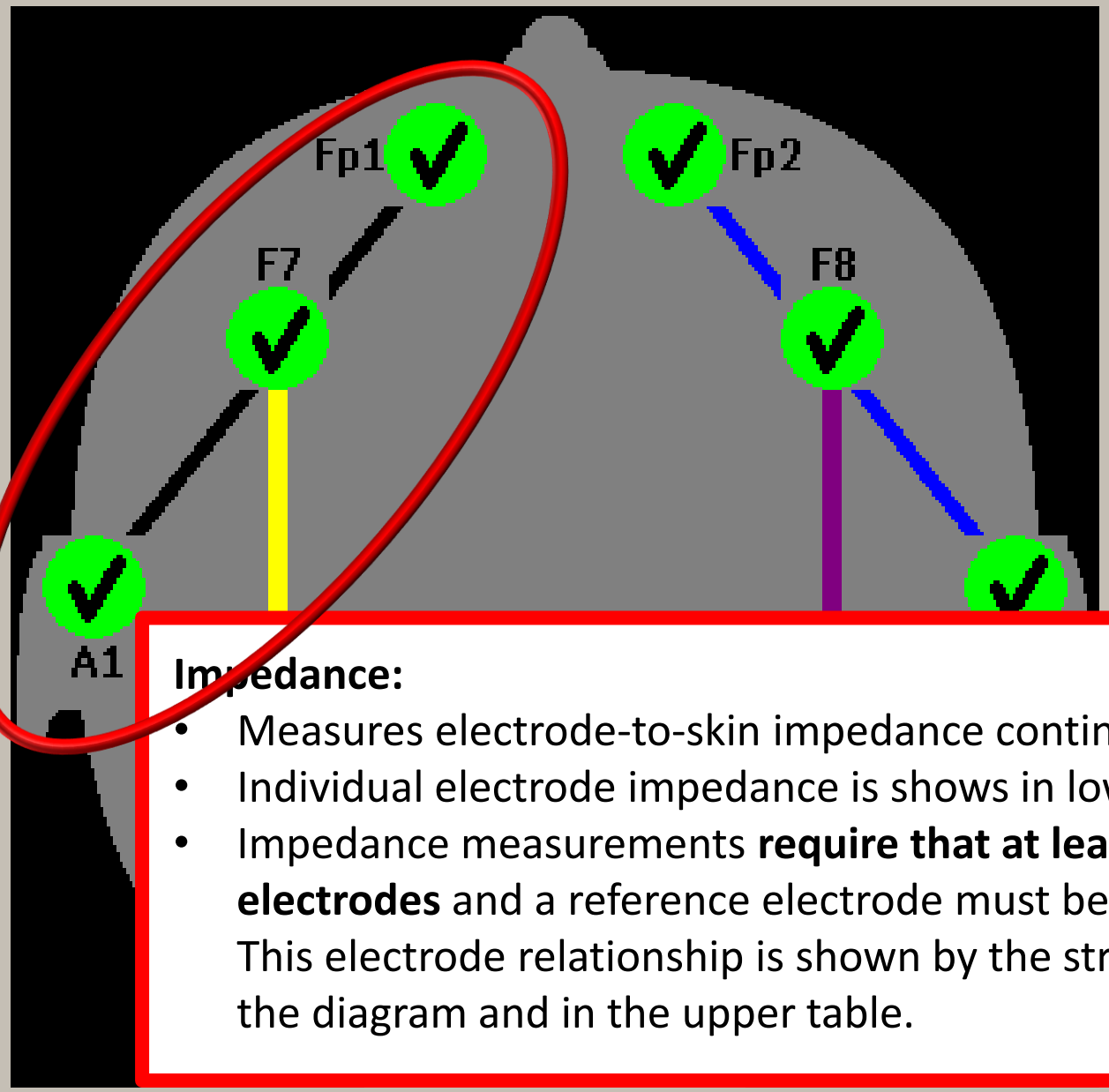
C (centre)

EEG1+	Fp1	2kOhm
EEG1-	A1	2kOhm
EEG2+	Fp2	2kOhm
EEG2-	A2	2kOhm
EEG3+	F7	2kOhm
EEG3-	T5	2kOhm
EEG4+	F8	2kOhm
EEG4-	T6	2kOhm


CSRU1
Not Admitted
1 Feb 2018 7:35
Adult
EEG
Unsupported LAN
SV Rhythm
to exit:
cycle power
ART
PAP
EEG1
EEG2
EEG3
EEG4
100µV
HR
60
ART
120/70
(91)
PAP
28/15
(21)
TP1
2.34
TP2
1.81
TP3
2.34
TP4
1.81
Pulse
60
PVC
0
ST-I 0.2
ST-II 0.0
ST-III -0.2
ST-aVR -0.1
ST-aVL 0.2
ST-aVF -0.1
CVP
(9)
ICP
Mean
(9)
etCO2
40
imCO2
awRR
20
RR
15
Delta1 2.5
Theta1 3.5
Alpha1 1.5
Beta1 92.5
Delta2 2.0
Theta2 3.0
Alpha2 2.0
Beta2 93.0
Clock
7:35
NBP Pulse 60
Sys.
140
90
Mean
100
60
120/
SEF1 24.0
MDF1 22.0
PPF1 23.5
SEF2 24.0
MDF2 22.0
PPF2 23.5
SEF3 24.0
MDF3 22.0
PPF3 23.5
SEF4 24.0
MDF4 22.0
PPF4 23.5
EEG Impedance / Montage
Fp1
Fp2
F7
F8
A1
A2
T5
T6
Long Bipolar
Long Bipolar
Ipsilat ear
Ref Fpz
Montage D
Montage E
5kOhm
Fp1-A1
Fp2-A2
F7-T5
F8-T6
Impedance
EEG2- A2 2kOhm
EEG3+ F7 2kOhm
EEG3- T5 2kOhm
EEG4+ F8 2kOhm
EEG4- T6 2kOhm
Silence
Pause Alarms
EEG Control
Change Name
Change Electrds
ImpLimit Down
ImpLimit Up
Main Setup
Main Screen
to exit:
cycle power


CSRU1
Not Admitted
1 Feb 2018 7:35
Adult
EEG
Unsupported LAN
SV Rhythm
to exit:
cycle power
ART
PAP
EEG1
EEG2
EEG3
EEG4
100µV
HR
60
ART
120/70
(91)
PAP
28/15
(21)
TP1
2.34
TP2
1.81
TP3
2.34
TP4
1.81
Pulse
60
PVC
0
ST-I 0.2
ST-II 0.0
ST-III -0.2
ST-aVR -0.1
ST-aVL 0.2
ST-aVF -0.1
CVP
(9)
ICP
Mean
(9)
etCO2
40
imCO2
awRR
20
RR
15
Delta1 2.5
Theta1 3.5
Alpha1 1.5
Beta1 92.5
Delta2 2.0
Theta2 3.0
Alpha2 2.0
Beta2 93.0
Clock
7:35
NBP Pulse 60
Sys.
140
90
Mean
100
60
120/
SEF1 24.0
MDF1 22.0
PPF1 23.5
SEF2 24.0
MDF2 22.0
PPF2 23.5
SEF3 24.0
MDF3 22.0
PPF3 23.5
SEF4 24.0
MDF4 22.0
PPF4 23.5
EEG Impedance / Montage
Fp1
Fp2
F7
F8
A1
A2
T5
T6
Long Bipolar
Long Bipolar
Ipsilat ear
Ref Fpz
Montage D
Montage E
5kOhm
Fp1-A1
Fp2-A2
F7-T5
F8-T6
Impedance
EEG2- A2 2kOhm
EEG3+ F7 2kOhm
EEG3- T5 2kOhm
EEG4+ F8 2kOhm
EEG4- T6 2kOhm
Silence
Pause Alarms
EEG Control
Change Name
Change Electrds
ImpLimit Down
ImpLimit Up
Main Setup
Main Screen
to exit:
cycle power

EEG Impedance / Montage



Long Bipolar

Impedance Limit: 5kOhm

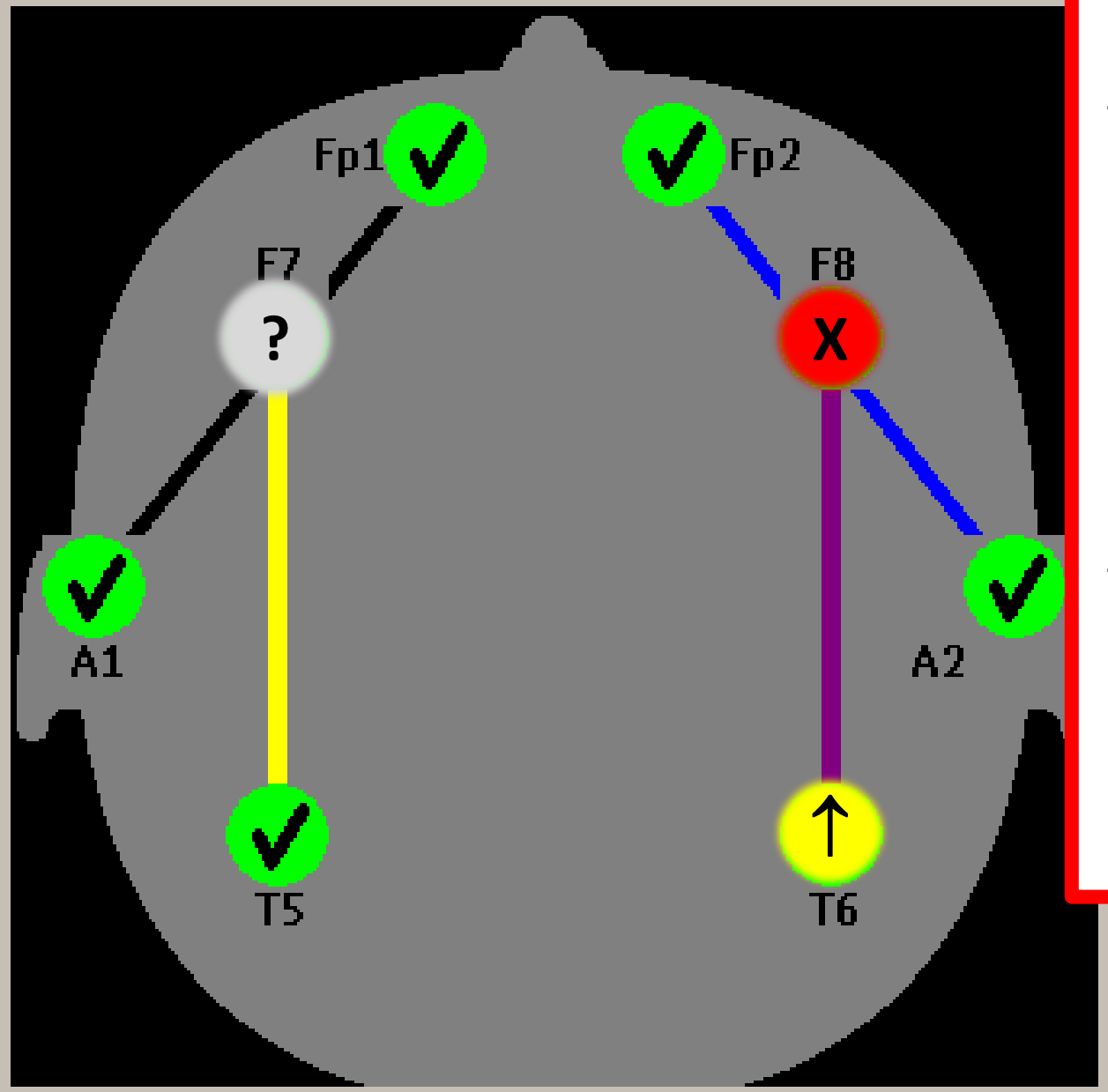
- EEG1 — Fp1-A1
- EEG2 — Fp2-A2
- EEG3 — F7-T5
- EEG4 — F8-T6

Channel	Impedance
Fp1	2kOhm
A1	2kOhm
Fp2	2kOhm
A2	2kOhm
F7	2kOhm
T5	2kOhm
F8	2kOhm
T6	2kOhm

Impedance:

- Measures electrode-to-skin impedance continuously
- Individual electrode impedance is shows in lower table
- Impedance measurements **require that at least 2 electrodes** and a reference electrode must be connected. This electrode relationship is shown by the straight lines in the diagram and in the upper table.

EEG Impedance / Montage



Impedance Code:

- √ impedance within range (< 5 kOhm)
- X electrode disconnected
- ↑ impedance above limit
- ? noisy signal

5kOhm
Fp1-A1
Fp2-A2
F7-T5
F8-T6

ance
kOhm
kOhm
kOhm
kOhm
kOhm
kOhm
2kOhm
2kOhm

EEG4- T6

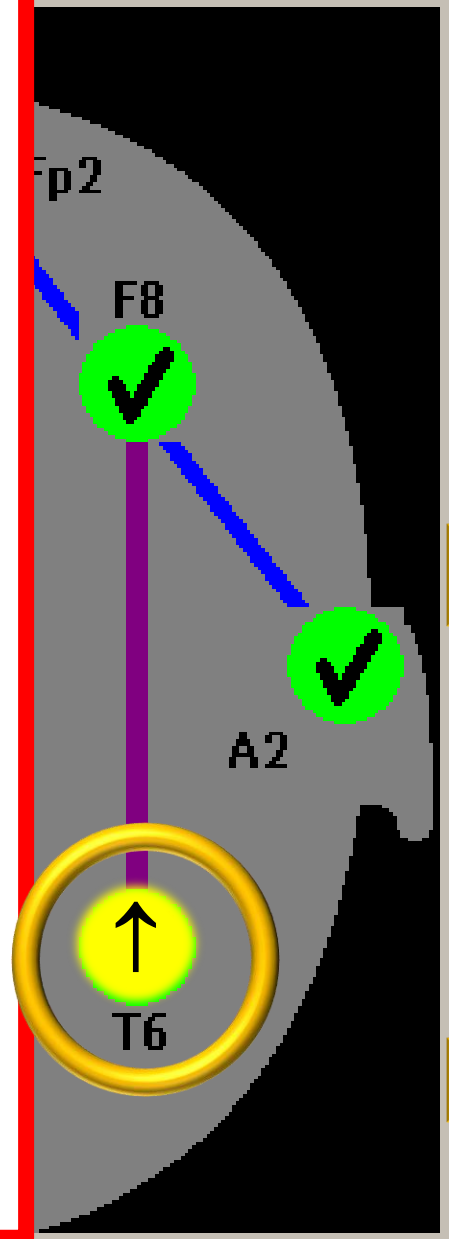
EEG Impedance / Montage

Checking Impedance:

Use the diagram and table to identify the electrode that requires attention (Example: T6 is > 5).

Re-prep the skin and apply a new electrode. Ensure that the lead is secure within the cable.

If this does not correct the problem, change the “partner electrode”. This is identified by the colored line in the diagram (purple for this example). It can also be identified in the Impedance Limit (the two leads required for EEG channel 4 in this example is F8 and T6.

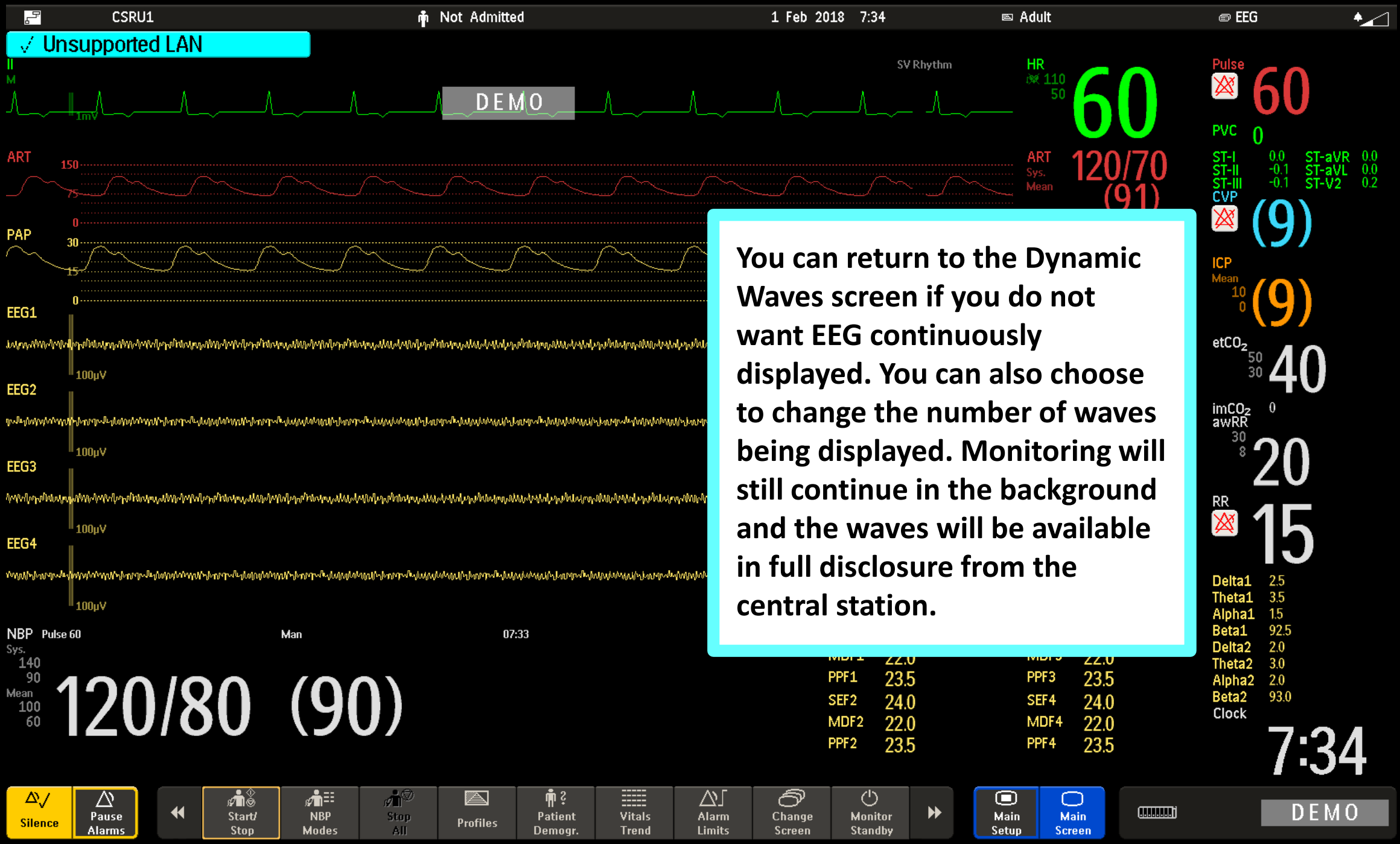


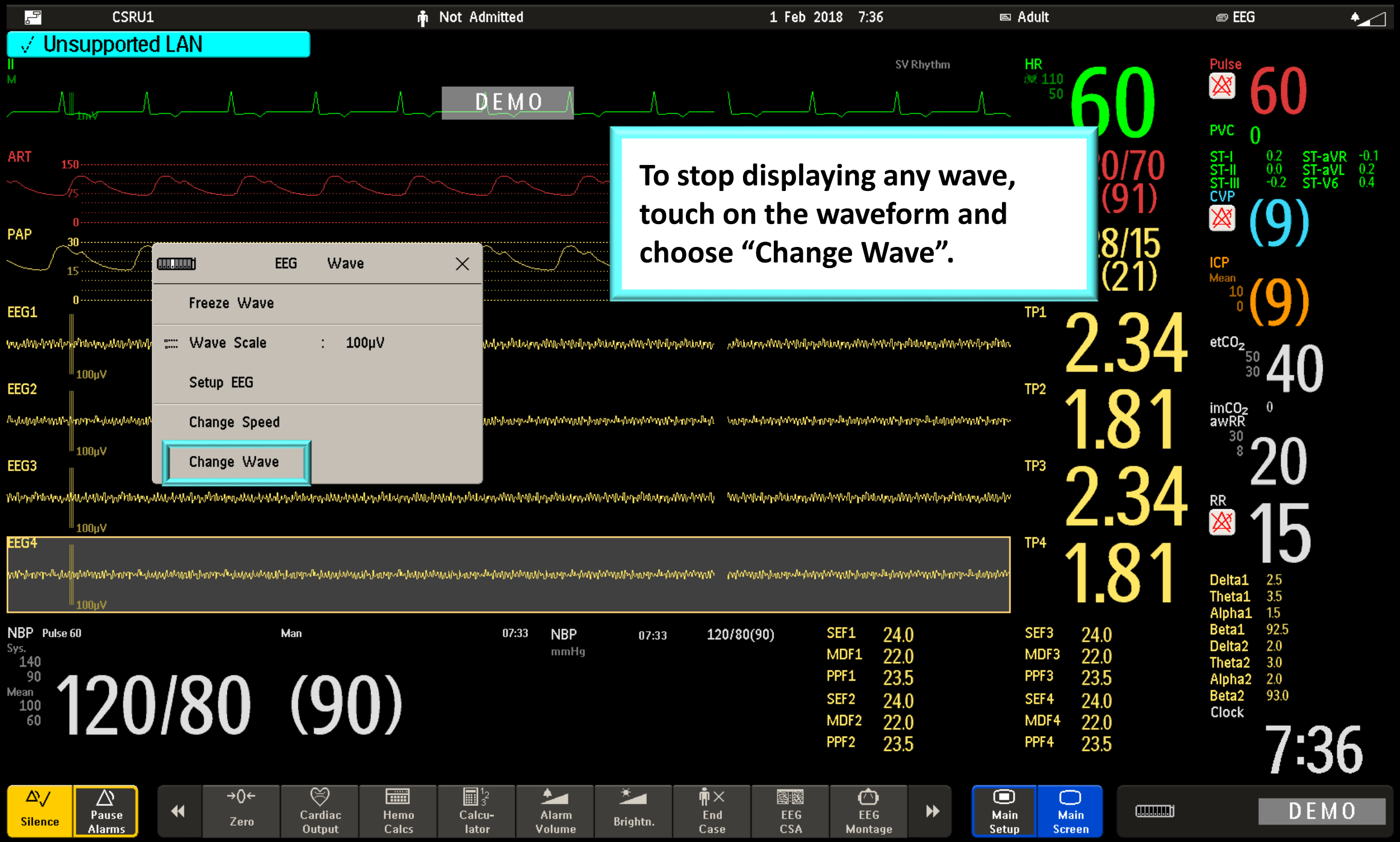
Long Bipolar

Impedance Limit: 5kOhm

EEG1	Fp1-A1
EEG2	Fp2-A2
EEG3	F7-T5
EEG4	F8-T6

Channel		Impedance
EEG1+	Fp1	2kOhm
EEG1-	A1	2kOhm
EEG2+	Fp2	2kOhm
EEG2-	A2	2kOhm
EEG3+	F7	2kOhm
EEG3-	T5	2kOhm
EEG4+	F8	2kOhm
EEG4-	T6	**6**Ohm

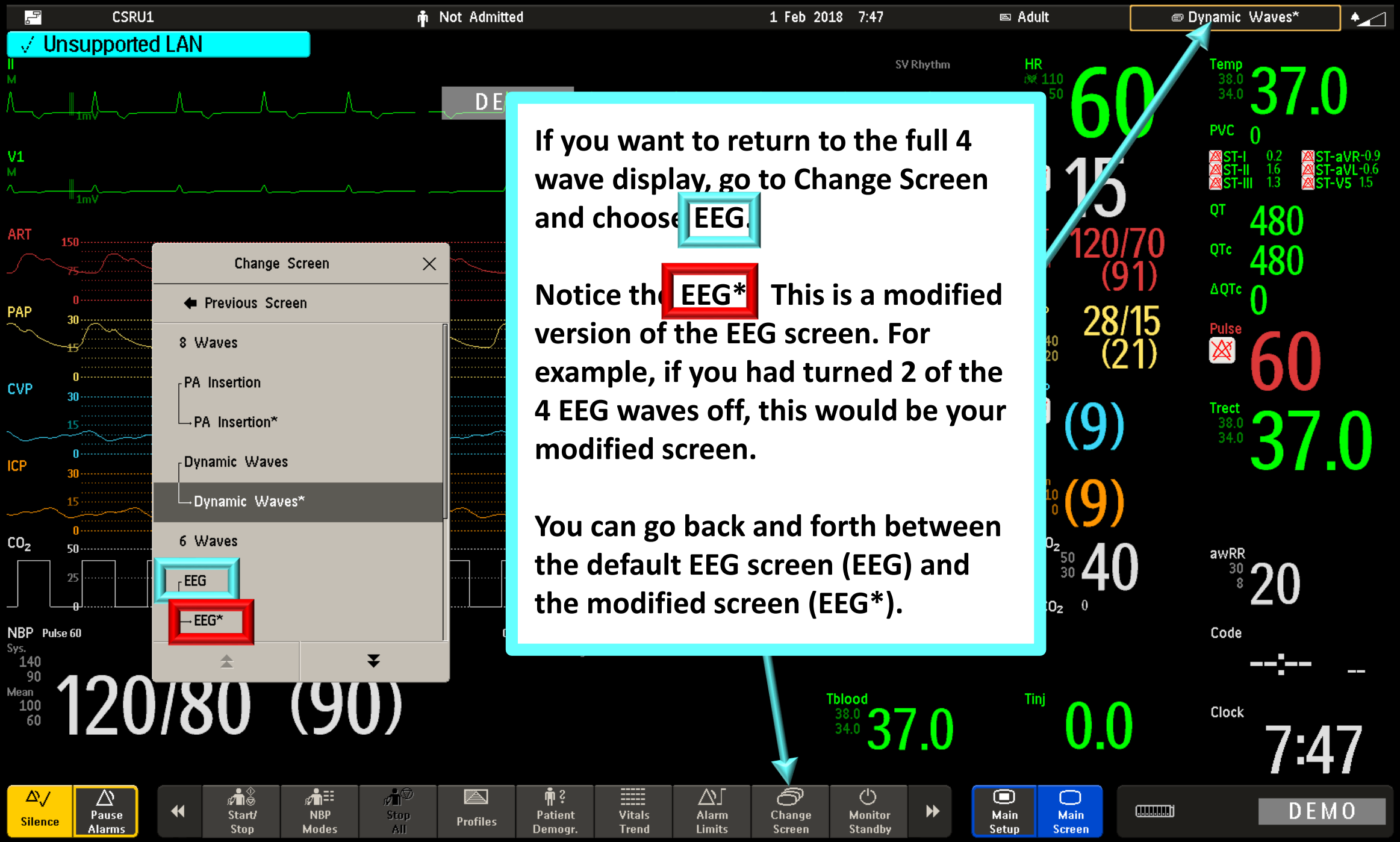

CSRU1
Not Admitted
1 Feb 2018 7:34
Adult
EEG
Unsupported LAN
DEMO
SV Rhythm
HR
60
ART
120/70
(91)
Pulse
60
PVC
0
ST-I 0.0
ST-II -0.1
ST-III -0.1
ST-aVR 0.0
ST-aVL 0.0
ST-V2 0.2
CVP
(9)
ICP
Mean
(9)
etCO2
40
imCO2
awRR
20
RR
15
Delta1 2.5
Theta1 3.5
Alpha1 1.5
Beta1 92.5
Delta2 2.0
Theta2 3.0
Alpha2 2.0
Beta2 93.0
Clock
7:34
ART
PAP
EEG1
EEG2
EEG3
EEG4
100µV
NBP Pulse 60
Man
07:33
Sys.
140
90
Mean
100
60
120/80 (90)
PPF1 23.5
SEF2 24.0
MDF2 22.0
PPF2 23.5
PPF3 23.5
SEF4 24.0
MDF4 22.0
PPF4 23.5
You can return to the Dynamic Waves screen if you do not want EEG continuously displayed. You can also choose to change the number of waves being displayed. Monitoring will still continue in the background and the waves will be available in full disclosure from the central station.
Silence
Pause Alarms
Start/ Stop
NBP Modes
Stop All
Profiles
Patient Demogr.
Vitals Trend
Alarm Limits
Change Screen
Monitor Standby
Main Setup
Main Screen
DEMO

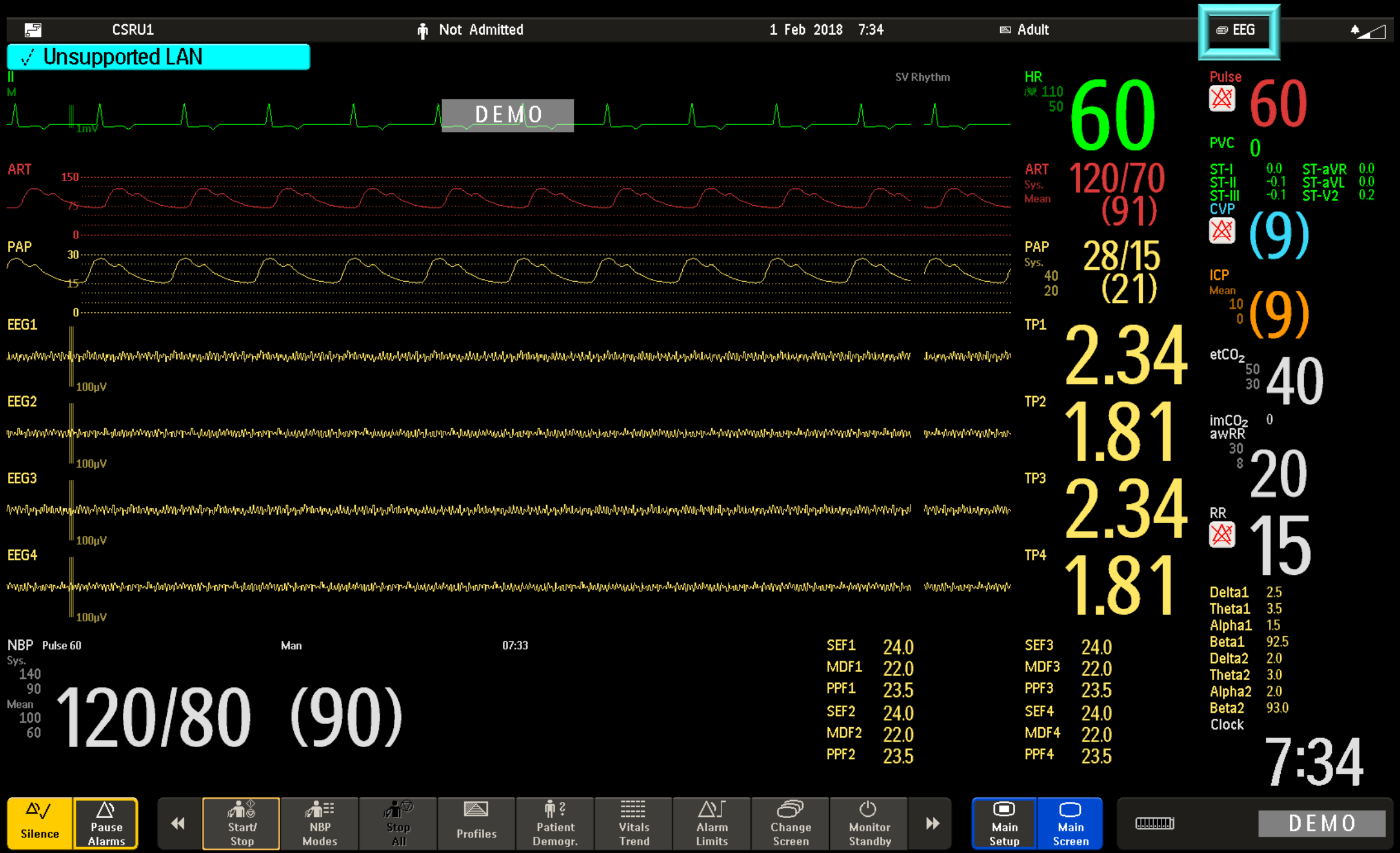

CSRU1
Not Admitted
1 Feb 2018 7:36
Adult
EEG
Unsupported LAN
DEMO
SV Rhythm
ART
PAP
EEG1
EEG2
EEG3
EEG4
100µV
EEG Wave
Freeze Wave
Wave Scale : 100µV
Setup EEG
Change Speed
Change Wave
To stop displaying any wave, touch on the waveform and choose “Change Wave”.
HR 60
Pulse 60
PVC 0
ST-I 0.2
ST-II 0.0
ST-III -0.2
ST-aVR -0.1
ST-aVL 0.2
ST-V6 0.4
CVP (9)
ICP Mean (9)
etCO2 40
imCO2 0
awRR 20
RR 15
TP1 2.34
TP2 1.81
TP3 2.34
TP4 1.81
Delta1 2.5
Theta1 3.5
Alpha1 1.5
Beta1 92.5
Delta2 2.0
Theta2 3.0
Alpha2 2.0
Beta2 93.0
Clock 7:36
NBP Pulse 60
Man
07:33
NBP mmHg
07:33
120/80(90)
Sys. 140 90
Mean 100 60
120/80 (90)
SEF1 24.0
MDF1 22.0
PPF1 23.5
SEF2 24.0
MDF2 22.0
PPF2 23.5
SEF3 24.0
MDF3 22.0
PPF3 23.5
SEF4 24.0
MDF4 22.0
PPF4 23.5
Silence
Pause Alarms
Zero
Cardiac Output
Hemo Calcs
Calcu-lator
Alarm Volume
Brightn.
End Case
EEG CSA
EEG Montage
Main Setup
Main Screen
DEMO


CSRU1
Not Admitted
1 Feb 2018 7:37
Adult
EEG
Unsupported LAN
DEMO
SV Rhythm
HR
110
50
60
Pulse
60
PVC
0
ST-I 0.3
ST-II 0.0
ST-III -0.3
ST-aVR -0.2
ST-aVL 0.3
ST-V4 1.4
CVP
(9)
ICP
Mean
10
0
(9)
etCO2
50
30
40
imCO2
awRR
30
8
0
20
RR
15
ART
150
75
0
PAP
30
15
0
EEG1
EEG2
EEG3
EEG4
100µV
Change Waves
Wave 1 : Any RT Wave
Wave 2 : Any RT Wave
Wave 3 : Any EEG
Wave 4 : Any EEG
Wave 5 : Any EEG
Wave 6 : Any EEG
To stop displaying any wave, touch on the waveform and choose “Change Wave”.
TP1
2.34
TP2
1.81
TP3
2.34
TP4
1.81
NBP Pulse 60
Man
07:33
NBP
mmHg
07:33
120/80(90)
Sys.
140
90
Mean
100
60
120/80 (90)
SEF1 24.0
MDF1 22.0
PPF1 23.5
SEF2 24.0
MDF2 22.0
PPF2 23.5
SEF3 24.0
MDF3 22.0
PPF3 23.5
SEF4 24.0
MDF4 22.0
PPF4 23.5
Delta1 2.5
Theta1 3.5
Alpha1 1.5
Beta1 92.5
Delta2 2.0
Theta2 3.0
Alpha2 2.0
Beta2 93.0
Clock
7:37
Silence
Pause Alarms
Zero
Cardiac Output
Hemo Calcs
Calcu-lator
Alarm Volume
Brightn.
End Case
EEG CSA
EEG Montage
Main Setup
Main Screen
DEMO


CSRU1
Not Admitted
1 Feb 2018 7:39
Adult
EEG*
Unsupported LAN
to exit:
cycle power
SV Rhythm
HR
60
Pulse
60
PVC 0
ST-I 0.3
ST-II 0.0
ST-III -0.3
ST-aVR -0.2
ST-aVL 0.3
ST-V5 0.7
CVP
(9)
ICP
Mean
(9)
etCO2
40
imCO2 0
awRR
20
RR
15
ART
PAP
EEG1
EEG2
EEG3
EEG4
Change Waves
Wave 1 : Any RT Wave
Wave 2 : Any RT Wave
Wave 3 : Any EEG
Wave 4 : Any EEG
Wave 5 : Any EEG
Wave 6 : Any EEG
Resp
EEG1
EEG2
EEG3
EEG4
Blank
Primary Lead
SecondryLead
Choose the wave you want to remove. “Wave 6” is the 6th waveform on the screen starting with the ECG. In this example, the 6th wave is EEG3.
TP2 1.81
TP3 2.34
TP4 1.81
NBP Pulse 60
Man
07:33
120/80(90)
120/80 (90)
SEF1 24.0
MDF1 22.0
PPF1 23.5
SEF2 24.0
MDF2 22.0
PPF2 23.5
SEF3 24.0
MDF3 22.0
PPF3 23.5
SEF4 24.0
MDF4 22.0
PPF4 23.5
Delta1 2.5
Theta1 3.5
Alpha1 1.5
Beta1 92.5
Delta2 2.0
Theta2 3.0
Alpha2 2.0
Beta2 93.0
Clock
7:39
Silence
Pause Alarms
Zero
Cardiac Output
Hemo Calcs
Calcu-lator
Alarm Volume
Brightn.
End Case
EEG CSA
EEG Montage
Main Setup
Main Screen
to exit:
cycle power


CSRU1
Not Admitted
1 Feb 2018 7:39
Adult
EEG*
Unsupported LAN
to exit:
cycle power
Change Waves
Wave 1 : Any RT Wave
Wave 2 : Any RT Wave
Wave 3 : Any EEG
Wave 4 : Any EEG
Wave 5 : Any EEG
Wave 6 : Any EEG
Resp
EEG1
EEG2
EEG3
EEG4
Blank
Primary Lead
SecondryLead
Arrow up or down until you see "Blank". This will turn the display off. Monitoring of this wave will continue in the background.
HR
Pulse
PVC
ST-I 0.3
ST-II 0.0
ST-III -0.3
ST-aVR-0.2
ST-aVL0.3
ST-V5 0.7
CVP
ICP
Mean
etCO2
imCO2
awRR
RR
TP2
TP3
TP4
NBP Pulse 60
Man
07:33
120/80(90)
Sys.
Mean
SEF1 24.0
MDF1 22.0
PPF1 23.5
SEF2 24.0
MDF2 22.0
PPF2 23.5
SEF3 24.0
MDF3 22.0
PPF3 23.5
SEF4 24.0
MDF4 22.0
PPF4 23.5
Delta1 2.5
Theta1 3.5
Alpha1 1.5
Beta1 92.5
Delta2 2.0
Theta2 3.0
Alpha2 2.0
Beta2 93.0
Clock
7:39
Silence
Pause Alarms
Zero
Cardiac Output
Hemo Calcs
Calcu-lator
Alarm Volume
Brightn.
End Case
EEG CSA
EEG Montage
Main Setup
Main Screen
to exit:
cycle power


CSRU1
Not Admitted
1 Feb 2018 7:47
Adult
Dynamic Waves*
Unsupported LAN
Change Screen
Previous Screen
8 Waves
PA Insertion
PA Insertion*
Dynamic Waves
Dynamic Waves*
6 Waves
EEG
EEG*
If you want to return to the full 4 wave display, go to Change Screen and choose EEG.
Notice the EEG* This is a modified version of the EEG screen. For example, if you had turned 2 of the 4 EEG waves off, this would be your modified screen.
You can go back and forth between the default EEG screen (EEG) and the modified screen (EEG*).
Silence
Pause Alarms
Start/ Stop
NBP Modes
Stop All
Profiles
Patient Demogr.
Vitals Trend
Alarm Limits
Change Screen
Monitor Standby
Main Setup
Main Screen
DEMO


CSRU1
Not Admitted
1 Feb 2018 7:34
Adult
EEG
Unsupported LAN
II
M
1mV
SV Rhythm
DEMO
ART
150
75
0
PAP
30
15
0
EEG1
100µV
EEG2
100µV
EEG3
100µV
EEG4
100µV
HR
110
50
60
ART
Sys.
Mean
120/70
(91)
PAP
Sys.
40
20
28/15
(21)
TP1
2.34
TP2
1.81
TP3
2.34
TP4
1.81
Pulse
60
PVC
0
ST-I 0.0
ST-II -0.1
ST-III -0.1
ST-aVR 0.0
ST-aVL 0.0
ST-V2 0.2
CVP
(9)
ICP
Mean
10
0
(9)
etCO2
50
30
40
imCO2 0
awRR
30
8
20
RR
15
Delta1 2.5
Theta1 3.5
Alpha1 1.5
Beta1 92.5
Delta2 2.0
Theta2 3.0
Alpha2 2.0
Beta2 93.0
Clock
7:34
NBP Pulse 60
Man
07:33
Sys.
140
90
Mean
100
60
120/80 (90)
SEF1 24.0
MDF1 22.0
PPF1 23.5
SEF2 24.0
MDF2 22.0
PPF2 23.5
SEF3 24.0
MDF3 22.0
PPF3 23.5
SEF4 24.0
MDF4 22.0
PPF4 23.5
Silence
Pause Alarms
Start/ Stop
NBP Modes
Stop All
Profiles
Patient Demogr.
Vitals Trend
Alarm Limits
Change Screen
Monitor Standby
Main Setup
Main Screen
DEMO