

EXTRA
BEAT OF THE
HEART

iVAC 2L Academy IABP Console

PULSE CATH

IABP was first tried in humans in 1968 by Dr. Kantrowitz (also did the first Cardiac transplant in USA)

Basic principle - Counterpulsation

- It is balloon inflation in diastole and deflation in early systole
- Balloon inflation causes 'volume displacement' of blood within the aorta, both proximally and distally
- This leads to a potential increase in coronary blood flow and potential improvements in systemic perfusion



iVAC 2L is compatible with any IABP available to the hospital.

The most common are the Datascope and Arrow.

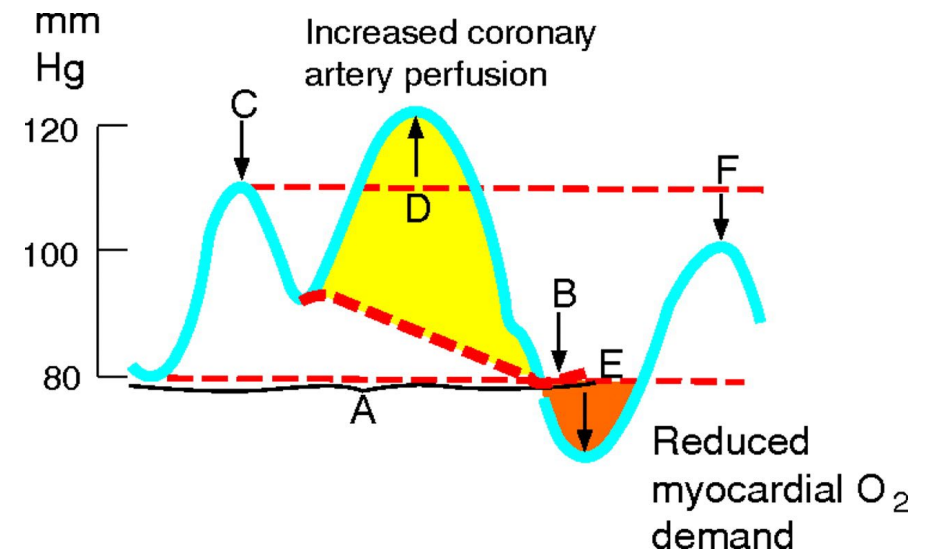
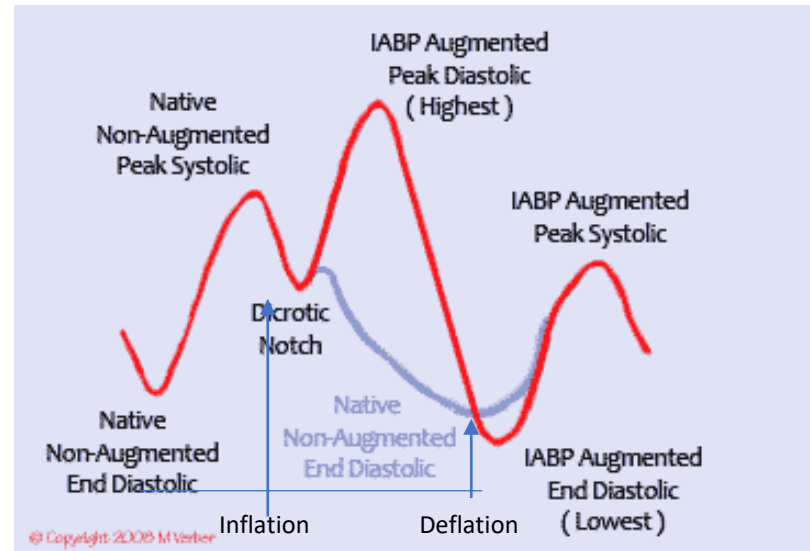
This presentation outlines how to use the console and overcome any issues that could possibly arise during a procedure.



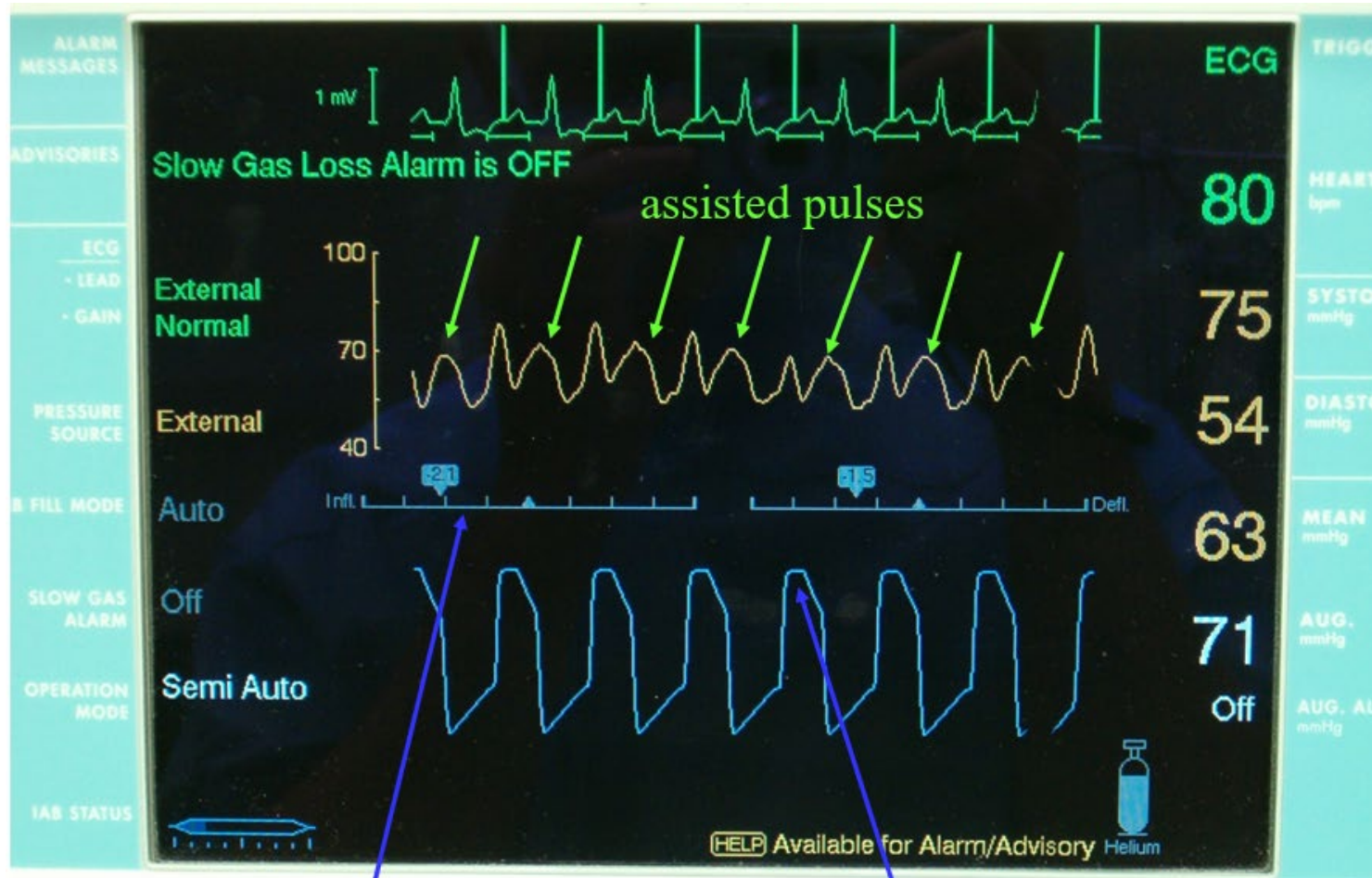
IABP Driver Timing characteristics

Waveform

- The balloon is inflated with Helium so that it quickly travels from pump and also gets absorbed in blood in case of rupture
- The console uses the ECG waveform or systemic arterial waveform as a trigger for inflation
- The balloon inflates with the onset of diastole, which corresponds with the middle of the T-wave (dicrotic notch on arterial wave)
- The balloon deflates at the onset of LV systole and this corresponds to the peak of the R-wave
- Since the distal aortic pressure drops with inflation, you can see a slight dip at the dicrotic notch followed by a second peak due to augmentation of the diastolic pressure



Datascope CS100 screen



Timing slightly early



"Round" balloon pressure (pulse)

IABP Setting

1. Set Operation mode on Semi-Automatic.
2. Set Trigger Source at ECG or AP.
3. Disable the Augmentation Alarm.
4. Disable the R-trac option (Select Pump Options -> R-trac).
5. When the iVAC 2L is connected: press the Start button.
6. Let the IABP driver fill the membrane pump.
7. Start the IABP driver at 1:2 frequency with maximum augmentation and observe the movements of the membrane of the membrane pump.
8. When the membrane is moving smoothly and the timing is correct, set the frequency at 1:1 for maximum performance.
9. In case of VT, VF, arrhythmia, cardiac arrest, Tachycardia, Bradycardia, etc. Move to internal mode trigger.

To use internal triggering: remove the ECG cable from the IABP driver. Replace the ECG cable when returning to the ECG or AP triggering mode.

In case of repeating alarms: set mode on Semi-Automatic; Press IAB Fill button (press 2 seconds); Let the IABP driver fill the Membrane pump. Set the IABP Fill mode at Manual Fill: Press the Pump options button, scroll through menu and set the Fill mode to manual. The Slow Gas Loss Alarm is now disabled; Press the Start

IABP Setting

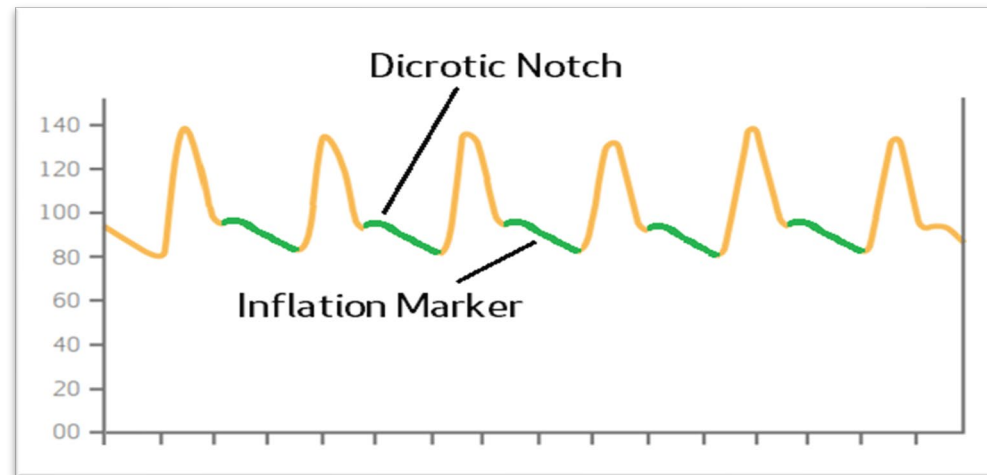
The image shows a control panel for IABP (Intra-Aortic Balloon Pump) settings. The panel is divided into several sections:

- OPERATION MODE:** Includes buttons for AUTO, Semi Auto (highlighted with callout 1), and Manual (Pediatric Only).
- Zero Pressure:** A button labeled "Zero Pressure" with "Hold 2 Sec." below it, highlighted with callout 6.
- START and STANDBY:** Large green "START" and yellow "STANDBY" buttons.
- TRIGGER SOURCE:** A list of sources: ECG (highlighted with callout 2), Pressure, Pacer V/AV, Pacer A, and Internal.
- IAB FREQUENCY:** Radio buttons for 1:1 (highlighted with callout 4), 1:2, and 1:3.
- AUGMENTATION:** A vertical green slider between "MAX" and "OFF" (highlighted with callout 4).
- IAB INFLATION:** Sliders for "Earlier" and "Later" timing.
- IAB DEFLATION:** Sliders for "Earlier" and "Later" timing.
- Bottom Section:** Includes "Alarm Mute", "IAB Fill" (Hold 2 Sec.), "Help", "Ref. Line", "Aug. Alarm" (highlighted with callout 5), "Open Menu", "Back", "ECG/AP Sources", "Pump Options", "User Preferences", "Inflation Interval", "Freeze Display", and "Print Strip" (Hold For Continuous).

Callout numbers 1 through 6 are placed in orange boxes with arrows pointing to the specific settings mentioned above.

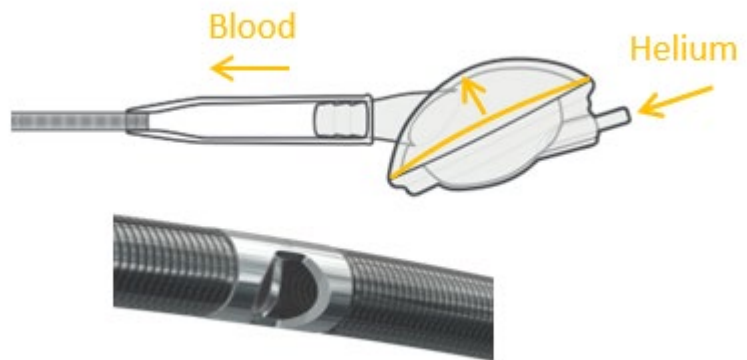
Operating the IABP driver

- The iVAC 2L should eject during diastole and aspirate during systole
 - the inflation may come as soon as the slope of AP curve is decreasing, just prior to the dicrotic notch
 - the deflation should be set prior to the systole of the heart
 - Correct timing should be determined by the shape of the AP curvature

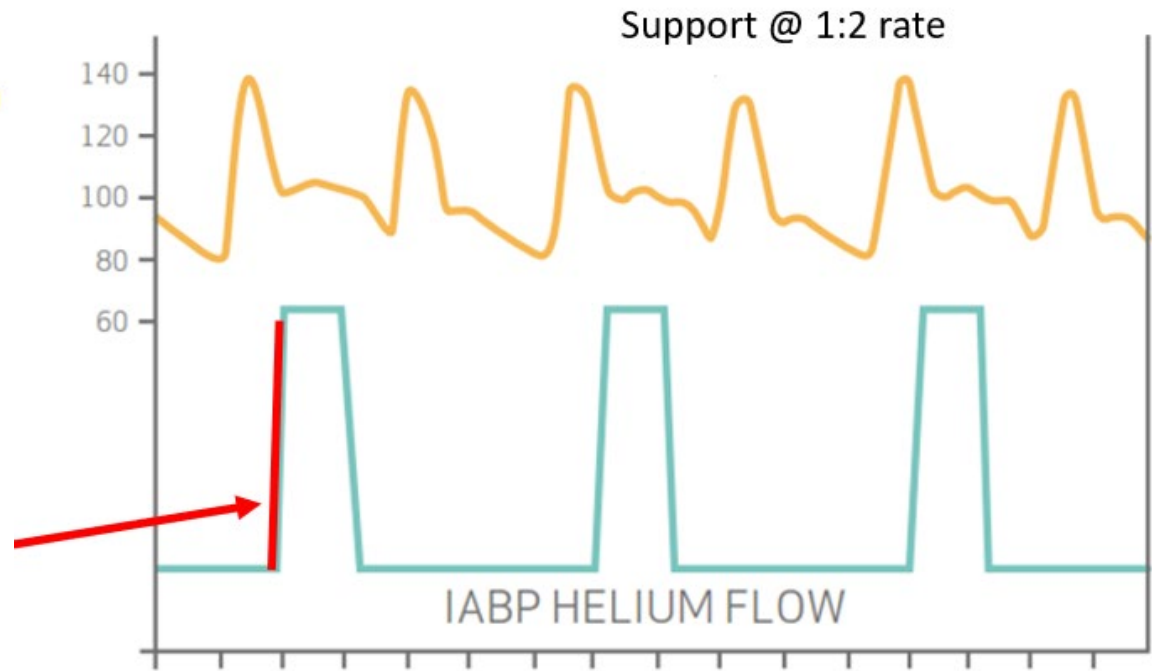


For detailed instructions please consult the Instructions for Use. This document is for information and illustration purposes only and is in no way, shape or form intended or construed to replace the instructions for use which should be consulted every time and to which this document is just an addition. This document is not to be interpreted as a medical advice either.

Operating the IABP driver

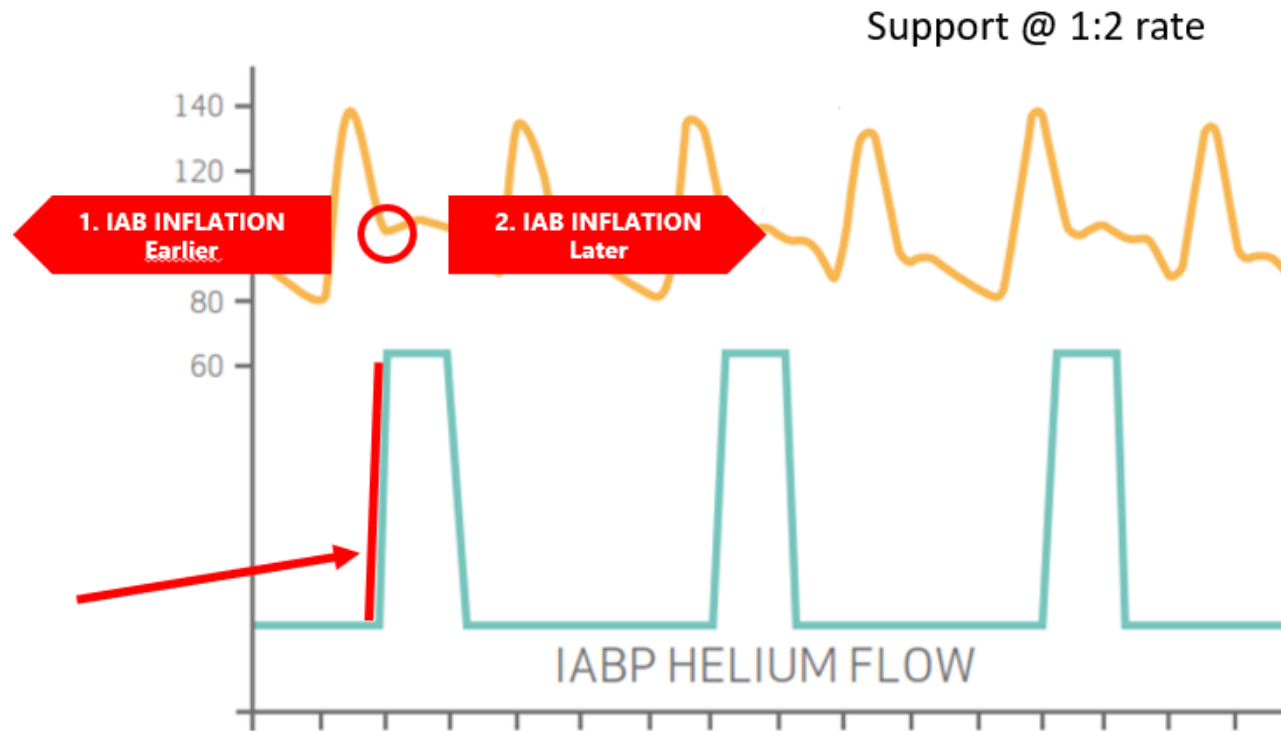


Indicates the flow of Helium from the console to the membrane pump (that corresponds to the ejection of blood into the ascending aorta).



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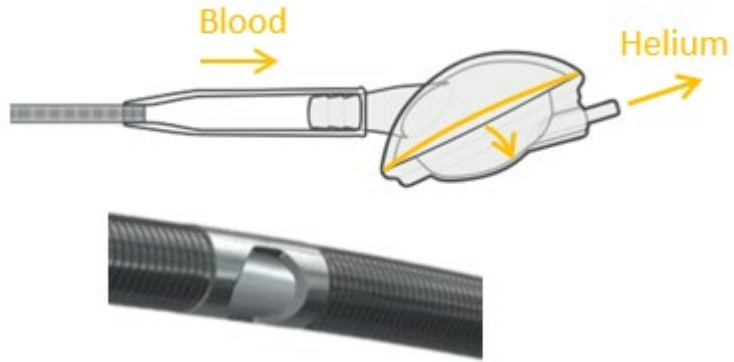
Operating the IABP driver



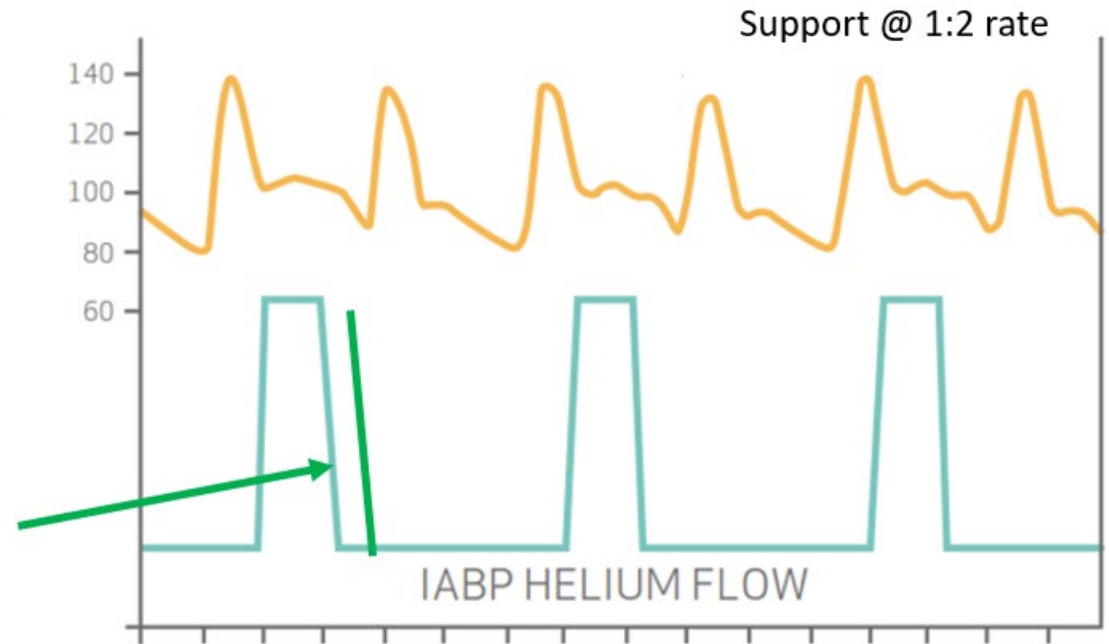
This line can be adjusted by using the **Inflation** buttons of the IABP keypad.

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Operating the IABP driver

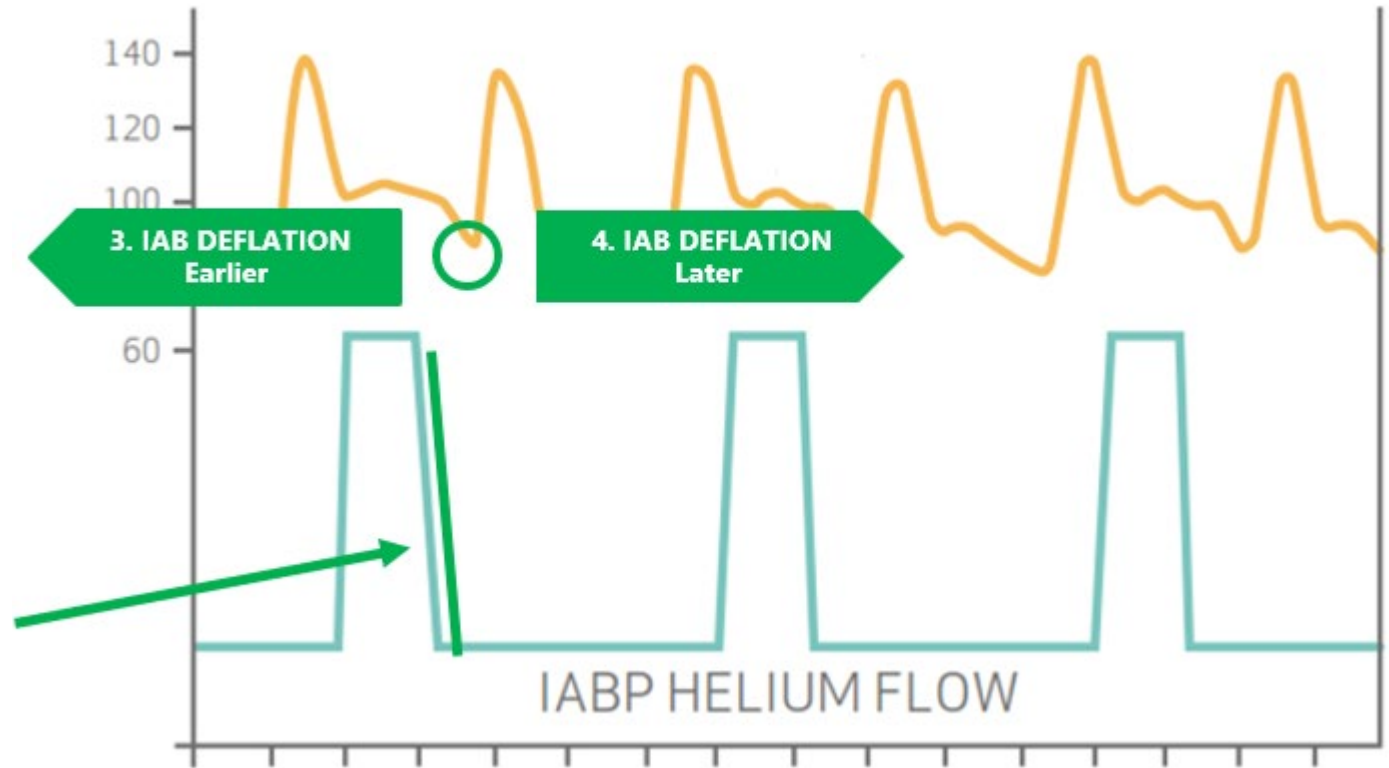


Indicates the flow of Helium from the membrane pump to the console (that corresponds to the aspiration of blood from the left ventricle).



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Operating the IABP driver



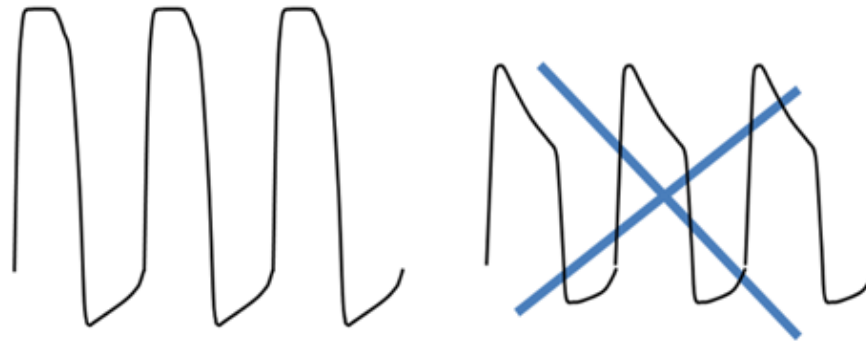
This line can be adjusted by using the **Deflation** buttons of the IABP keypad.

Support @ 1:2 rate

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Operating the IABP driver

- The shape of the “Balloon Pressure Waveform” gives an indication of correct functioning
- A round shape of the pressure peaks indicate correct functioning
- Sharp peaks indicate an inflow obstruction, an incorrect position, or bad timing



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Operating the IABP driver

- Smooth movement of the membrane pump indicates unrestricted blood inflow
- Disturbed membrane movement or membrane pump vibration during aspiration shows restricted blood inflow
 - This can be solved by gently pulling the iVAC 2L catheter backwards
- The “ticking” of the iVAC 2L valve is audible
- One “tick” per beat indicates unrestricted functioning of the iVAC 2L
- A series of ticks per beat indicates restricted movements
 - This can be solved by rotating the iVAC 2L catheter

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Thank you for Listening

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