

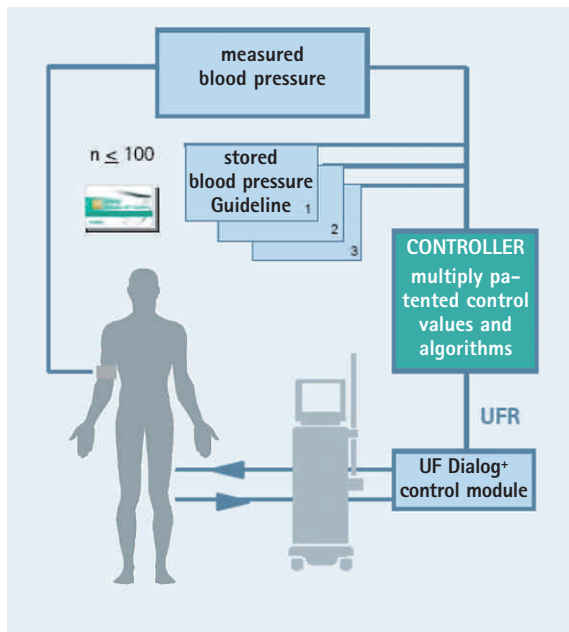
# bioLogic RR® Comfort biofeedback system

Brief description



# Introduction

Brief description of the bioLogic RR® Comfort biofeedback system from B. Braun



## bioLogic RR® Comfort

The automatic bioLogic RR® Comfort blood pressure stabilisation unit is a further development of the bioLogic RR® system. In the application to date, the patient's blood pressure is measured in 5-minute intervals and interpreted for the purpose of ultra-filtration control.

The new bioLogic RR® Comfort option is based on the realisation that patients reveal personal blood pressure patterns during a treatment. In place of current blood pressure trends, this system draws on typical blood pressure patterns from the past in conjunction with the currently measured value for UF control. In a patient-specific memory (Patient Therapy Card, diskette, Nexadia®), these patterns are collated and evaluated following a "learning phase" comprising a selection of three treatments.

From the stored patient curves, this innovative technique selects the one with the greatest correspondence by comparison current with stored blood pressure values in the beginning of the running therapy. The selected curve is assumed as the **guideline** for the ongoing treatment. Subsequently, it is used for UF control in conjunction with the current blood pressure pattern.

At the same time, the system permits an automated expansion of the above-described **measurement intervals**, to reduce the burden on the patient. In contrast to bioLogic RR®, the intervals with the bioLogic RR® Comfort can be 15, 20 or 30 minutes instead of 5 minutes, which reduces the measurements frequency by an average of approx. 60%.

In the case of hypotensive episodes, extended intervals are reduced to 5 minutes again until the patient's blood pressure has stabilised.

All blood pressure curves are recorded so that a total of up to 100 curves are available. Additional manual blood pressure measurements, e.g. within a long interval, are accepted by the system.

# Functionality

## The first 3 learning treatments

The system familiarises itself with the patient in these initial treatments. This requires consistent 5-minute measurements. The minimum treatment time must be 3.5 hours. From the 4th treatment onwards, the system can access the memory and the guideline technology starts.

## UF control

biologic RR® Comfort draws on several parameters when controlling the ultra-filtration:

- the current UF volume
- the current blood pressure value
- the short- and long-term trends during treatment.

This is an intelligent, forward-looking system.

## Online adaptation

The guideline adapts to the deviations to the current blood pressure curve occurring in all new treatments (online adaptation) and is stored again. Hence, the system becomes increasingly accurate as the number of stored curves grows.

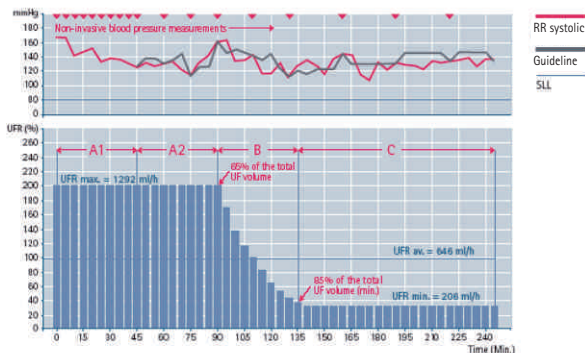
## UF profile

As blood pressure decreases usually in the second half of the treatment, the system is combined with a UF profile. In the first part of the treatment, the patient should have as much liquid removed as the patient's personal blood pressure permits.

## Number of blood pressure measurements

- Treatment with bioLogic RR® Comfort is split into phases with **measurement intervals of differing lengths**.
- The measurement intervals extend **depending on the removed ultra-filtration volume**. The set max. UF rate is decisive for this.
- A higher UF rate at the beginning permits early reaching of the A2, B and C phases. Hence, the system can also work with extended measurement intervals sooner.
- In the ideal case, the number of measurements can be reduced to 18 for a 4-hour treatment.

### Optimum treatment progression with the bioLogic RR® Comfort














Range	Duration	UF volume reached	Regular measurement interval
A1	45 min	variable	5 min
A2	variable	up to 65%	15 min
B	variable	up to 85%	20 min
C	variable	from 85%	30 min

# Handling



In **Preparation** or **Treatment** mode, touch icon.

The following screen appears:

Heinz, David		Hemodialysis		bioLRR/Ac.run			
Feb 2, 2009 - 18:22 -				HDF/HF OFF			
<b>bioLogic RR</b> <b>GL</b>		UF volume	2000 [ml]				
SYS lower limit	80 [mmHg]	UF time	4:00 [h:min]				
Set suggested SLL as required		Suggested SYS lower limit	80 [mmHg]				
bioLogic RR	750 [ml/h]	Act/Req UF volume	0 [%]				
UF rate max.	150 [%]	Average UF rate	500 [ml/h]				
UF rate max. in [%]		Total of Inf.volumes	0 [ml]				
							
							

- **bioLogic RR®**: operation without guideline function with measurement in 5-minute intervals
- **GL**: Guideline function = bioLogic RR® Comfort  
**A memory medium (diskette, Patient Therapy Card, Nexadia®) is required for this application**
- **SYS lower limit value (SLL)**: the UF control starts at the set target value plus 25%
- **Suggested systolic lower limit**: recommended value
- **UF rate max.**: max. rate in ml/min
- **UF rate max. in %**: average UF rate = 100%

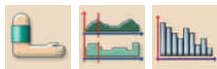
## Settings

- \_\_\_\_\_ For bioLogic RR® Comfort, touch **GL** (= guideline)
- \_\_\_\_\_ When first using bioLogic RR® Comfort, the function **must** be manually activated (**bioLogic RR®** and **GL** must be touched)

## Recommended settings

- \_\_\_\_\_ Max. UF rate  $\geq$  **160%**
- \_\_\_\_\_ Min. UF rate: **50 ml/h** (entry in the UF window)
- \_\_\_\_\_ SLL: assume suggested value or  $\leq$  **80 mmHg**
- \_\_\_\_\_ If the **suggested SLL** button in the TSM is deactivated or the value is not required, it should be defined by the physician

## Graphic display



\_\_\_\_\_ Touch icons.

The graphic screen appears. Cursor function:

- \_\_\_\_\_ Entry directly via time or
- \_\_\_\_\_ move cursor over << and >>
- \_\_\_\_\_ The values are correspondingly shown

# FAQs

For which patients is the bioLogic RR® Comfort suitable?

For patients who have a tendency towards hypotensive episodes.

Are there contraindications?

In principle, no. Occasionally, patients who are taking strong anti-coagulants suffer bruises on the upper arm.

Can bioLogic RR® Comfort also be used for SN and HDF / HF?

Yes.

What settings need to be carried out?

All that needs to be set are the maximum UF rate and the systolic lower limit (SLL).

What is the systolic lower limit (SLL)?

The absolute minimum system-tolerated limit value for the patient. If the blood pressure falls below this value, the UF is set to UF min. However, the fuzzy control starts at a value of  $SLL + 25\%$ , in other words, at  $SLL = 80$  mmHg, for example, the control starts at 100mmHg.

How does the bioLogic RR® determine the suggested SLL?

The basis is the mean value of the measurements between the 90th and 150th minute of the last two treatments. The SLL recommends 80% of this value.

How many blood pressure patterns can be stored?

A maximum of 100.



How can I control whether the Comfort function is running or whether curves are stored?

In the main screen's Service submenu (**screwdriver** icon), page 2, under **Miscellaneous / bioLogic RR®**, contains the number of GL = x curves.

How long after starting treatment can bioLogic RR® Comfort be started or stopped?

The system can be activated and deactivated within the first 5 minutes following the start of the treatment. An additional query has to be confirmed after the sixth minute to stop the system. After confirming, activating the function is no longer possible. It is not possible to start bioLogic RR® Comfort after the fifth minute of treatment.

Is non-achievement of the ultra-filtration volume within the set time displayed?

Yes. A warning appears if 70% of the UF volume is not reached within 70% of the time. An alarm appears in the event of non-achievement of 80% of UF within 80% of the time.

Can incorrect measurement occur?

Yes, particularly in the case of the patient moving his/her arm or when using the incorrect cuff size. Warnings can appear depending on the strength of the movement.

What happens in the event of measurement errors within the first 45 minutes?

As the system lacks the basis for the similarity calculation, the treatment is continued at 5-minute intervals.

For what reason might there still be 5-minute measurements following the 3rd treatment?

- The SLL has been set too high, the system is constantly controlling
- The first 3 treatments are shorter than 3.5 hours
- Error measurement during the first 45 minutes of treatment
- Patient blood pressure drops
- The blood pressure patterns were not stored
- The comfort function was not activated in the TSM
- The comfort function has been activated in the TSM, but the **GL** button was not pressed during treatment

What are the benefits of the system?

- A patient-specific, self-learning system thanks to the guideline technology
- In contrast to the blood volume, the blood pressure is used as a reliable entry parameter for the UF control
- There are no follow-up costs
- Simple handling, requires only 2 settings
- In the ideal case, only 18 measurements are required during a 4-hour treatment
- Reduction of hypotensive episodes by approx. 44%
- The reduction in hypotensive episodes means there is more time for the patient and other tasks

# Notes



These brief instructions are not a substitute  
for reading the detailed instructions

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