

# Microdialysis for Clinical Use

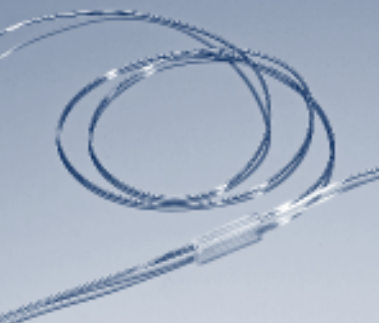
Portable Microdialysis Pumps



Microdialysis Analyzers



Sterile Microdialysis Catheters



 dialysis



## Introduction

The ability to diagnose a disease or condition prior to the onset of clinical signs would markedly change the way medicine is practiced today and ultimately drive the improvement of patient care. Monitoring tissue chemistry and diagnosis based on changes in the local metabolism offer windows of opportunities that may lead to improved quality of life.

The idea of Microdialysis is simple: a thin dialysis tube is introduced into the tissue and perfused with a physiological salt solution. Molecules diffuse over the membrane and the perfusate gradually equilibrates with the composition of the interstitial fluid – analogous to a capillary perfused with blood.

The technique of microdialysis has advanced well beyond its first application in the brain tissue of small rodents, and is continually finding new applications in larger animals and patients. Parts of the clinical microdialysis system include: small battery driven microdialysis pumps (a), sterile microdialysis catheters (b), specialized collection vials (c), and a chemical microdialysis analyzer (d) that can measure markers of cellular damage as well as substances related to energy metabolism. These analyte levels can then be displayed on a screen within minutes.

Today this system is being used throughout the world for clinical research as well as for routine monitoring of the human brain in neurointensive care and free flaps following reconstructive surgery. In Europe, microdialysis instruments are CE labeled according to the Medical Device Directive (MDD). Some of the catheters have been cleared by the US FDA for the Neuromonitoring application. Other catheters in this catalogue are in the US considered investigational devices, and therefore are limited by US law to investigational use, only in Institutional Review Board (IRB) approved or, if applicable, FDA-approved studies.

Microdialysis Pump (a)

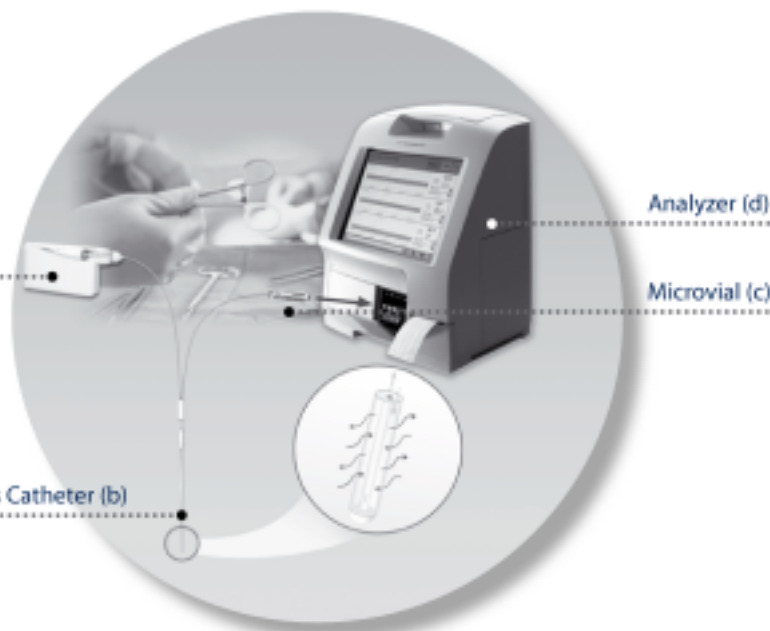
Analyzer (d)

Microvial (c)

Microdialysis Catheter (b)

### The Microdialysis System

Perfusion Fluid flows from the Microdialysis Pump (a) through the Microdialysis Catheter (b) into a Microvial (c) for collection. After the sampling period, the microvial is transferred to the Microdialysis Analyzer (d) for the analysis. The results are then displayed on the screen.



# 61 Hepatic Microdialysis Catheter

for metabolic research in liver tissue

## ORDERING INFORMATION

### 61 Hepatic Microdialysis Catheter 4/pkg

61 Hepatic Microdialysis Catheter includes Splitable Introducer SI-2 (4/pkg)	Ref. No. 8010226
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### Accessories

For product information on Microvials, Microvial racks, Syringes, Perfusion Fluid and Tunneling needle, see page 24-27.

#### Parts of the 61 Hepatic Microdialysis Catheter

1. Dialysis membrane

2. Shaft

3. Liquid cross

4. Outlet tube

5. Vial holder

6. Microvial
7. Inlet tube

8. Luer-Lock connection

9. Fixating device (PEBAX®)

10. Suture

11. Splitable Introducer

## TECHNICAL INFORMATION

Membrane cut-off: 20 000 Daltons

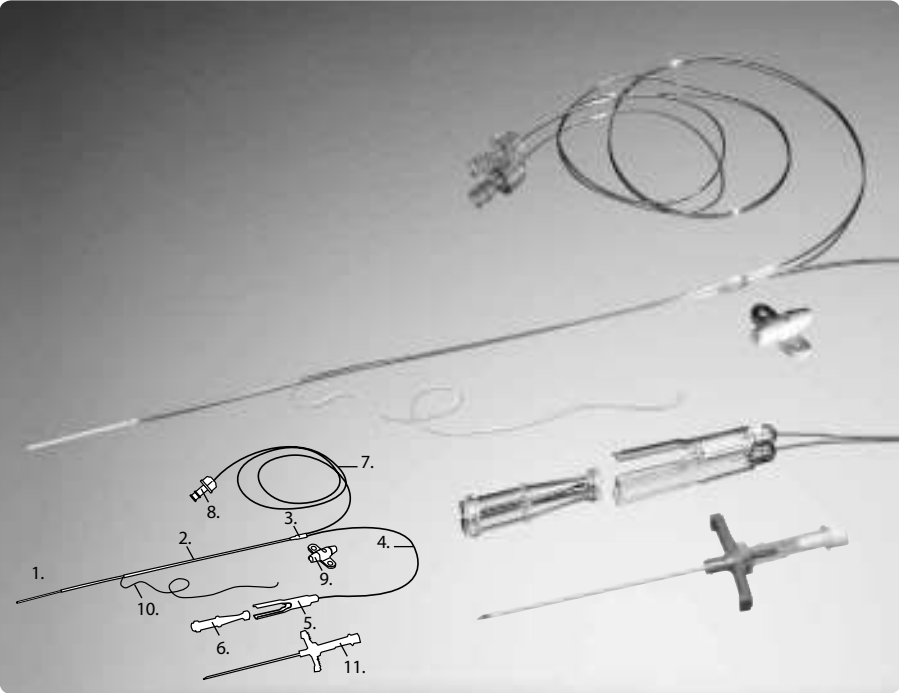
	Material	Length (mm)	Diameter (mm)
Inner Shaft	PUR**	310	0.9
Outer Shaft	PUR**	280	1.5
Membrane	PAES*	30	0.6
Inlet tubing	PUR**	400	1.0
Outlet tubing	PUR**	70	1.0

\* polyarylethersulfone \*\* polyurethane

THE sterile, single use 61 HEPATIC MICRODIALYSIS CATHETER has a very long shaft to allow continuous collection of tissue metabolites in the liver for several days. The dialyzing membrane has excellent diffusion characteristics that allow a high recovery of substances from the extracellular fluid.

The 61 Hepatic Microdialysis Catheter has a shaft length of 310 mm with a 30 mm PAES membrane. It is introduced into the abdominal cavity via a tunneling needle. Insertion into the liver is achieved with the help of a splitable introducer. After insertion, the catheter shall be fixed with the attached suture.

The inlet tubing of the catheter is connected to a Microdialysis Pump and the outlet ends in a microvial which collects the sample. The samples can be analyzed in the Microdialysis Analyzer for Glucose, Lactate, Pyruvate, Glycerol, Glutamate and Urea or sent to the laboratory for further analysis.



CAUTION: Investigational Device  
Limited by United States Law to Investigational Use.  
To be used only for Institutional Review Board (IRB) approved or, if applicable, FDA approved studies.

- \* For monitoring in hepatic tissue

\* Easy to insert into the tissue with the splitable introducer

\* Gold tip for location by CT Scan

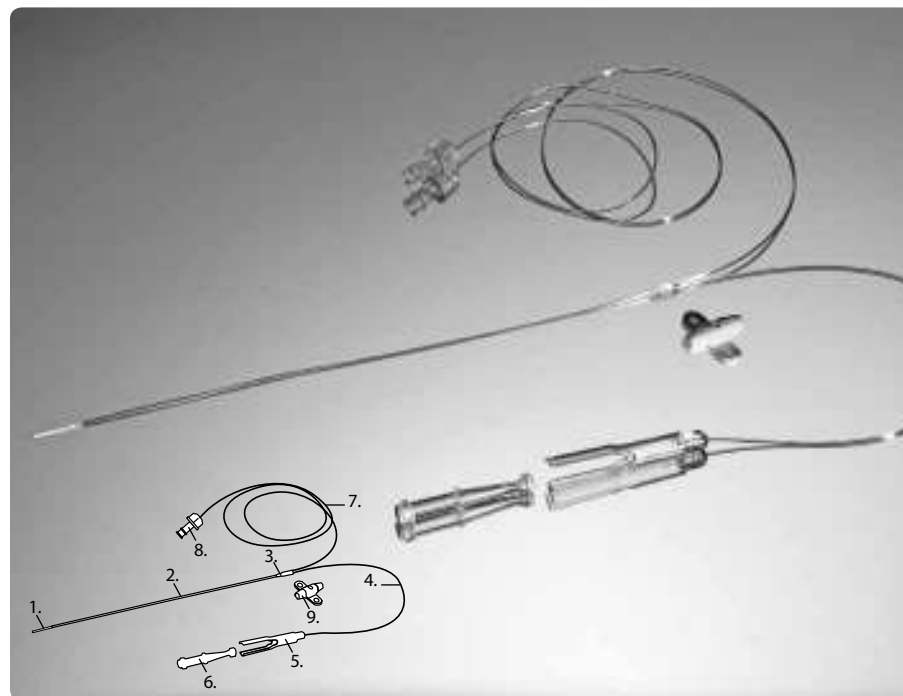
## 62 Gastrointestinal Microdialysis Catheter

for Microdialysis in intraperitoneal cavity

THE sterile, single use 62 GASTROINTESTINAL MICRODIALYSIS CATHETER is a unique device. It allows monitoring and detection of local changes in metabolism in the gastrointestinal tract for several days.

The 62 Catheter has a shaft length of 180 mm with a 30 mm membrane. The catheter is introduced into the intraperitoneal cavity during open surgery.

The dialyzing membrane of this microdialysis catheter has excellent diffusion characteristics that allow a high recovery of substances from the intraperitoneal fluid. The catheter inlet tubing is connected to a Microdialysis Pump and the outlet ends in a microvial which collects the sample. The samples can be analyzed in the Microdialysis Analyzer for Glucose, Lactate, Pyruvate, Glycerol, Glutamate and Urea or sent to the laboratory for further analysis.



CAUTION: Investigational Device

Limited by United States Law to Investigational Use.

To be used only for Institutional Review Board (IRB) approved or, if applicable, FDA approved studies.

- \* High biocompatibility
- \* Designed to monitor metabolic changes
- \* Gold tip for location by CT scan

### ORDERING INFORMATION

#### 62 Gastrointestinal Microdialysis Catheter 4/pkg

Ref. No.

62 Gastrointestinal  
Microdialysis Catheter

8010292

#### Accessories

For product information on Microvials, Microvial racks, Syringes, Perfusion Fluid and Tunneling needle, see page 24-27.

#### Parts of the 62 Gastrointestinal Microdialysis Catheter

- |                      |                            |
|----------------------|----------------------------|
| 1. Dialysis membrane | 6. Microvial               |
| 2. Shaft             | 7. Inlet tube              |
| 3. Liquid cross      | 8. Luer-Lock connection    |
| 4. Outlet tube       | 9. Fixating device (PEBAX) |
| 5. Vial holder       |                            |

### TECHNICAL INFORMATION

Membrane cut-off: 20 000 Daltons

	Material	Length (mm)	Diameter (mm)
Shaft	PUR**	180	0.9
Membrane	PAES*	30	0.6
Inlet tubing	PUR**	600	1.0
Outlet tubing	PUR**	220	1.0

\* polyarylethersulfone \*\* polyurethane

# 63 Microdialysis Catheter

for Microdialysis in liver, resting skeletal muscle and adipose tissue

## ORDERING INFORMATION

### 63 Microdialysis Catheter

4/pkg	Ref. No.
63 Microdialysis Catheter 60/10, includes Splitable Introducers	8010509
63 Microdialysis Catheter 40/30, includes Splitable Introducers	8010514

### Accessories

For product information on Microvials, Microvial racks, Syringes, Perfusion Fluid and Splitable Introducer, see page 24-27.

#### Parts of the 63 Microdialysis Catheter

1. Dialysis membrane

2. Shaft

3. Liquid cross

4. Outlet tube

5. Vial holder
6. Microvial

7. Inlet tube

8. Luer-Lock connection

9. Fixating device (PEBAX)

10. Splitable Introducer

## TECHNICAL INFORMATION

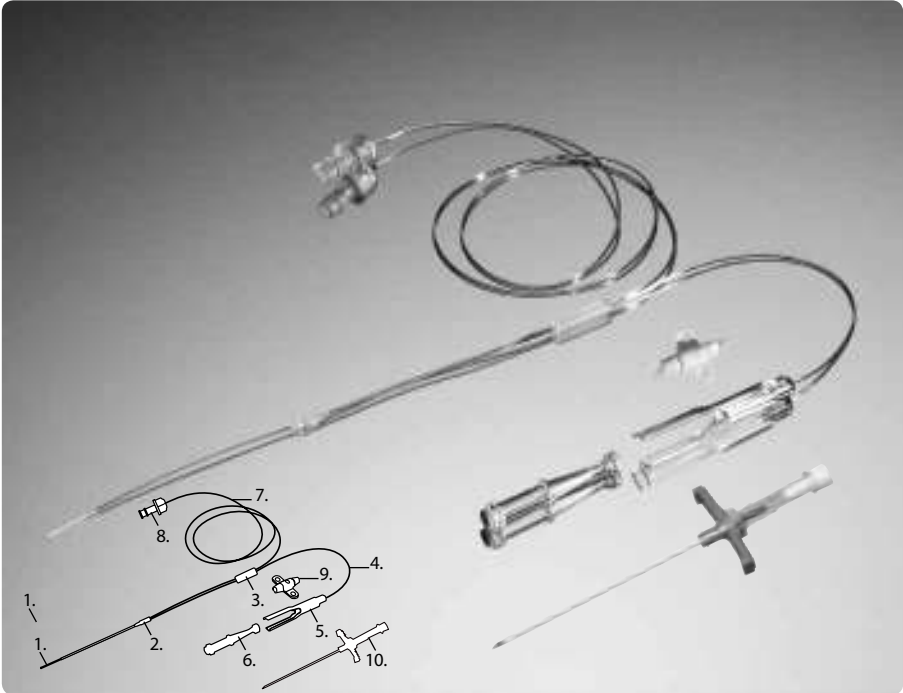
Membrane cut-off: 20 000 Daltons

	Material	Length		Diameter
		(mm)	(mm)	(mm)
Shaft	PUR**	60	40	0.9
Membrane	PAES*	10	30	0.6
Inlet tubing	PUR**	600	600	1.0
Outlet tubing	PUR**	220	220	1.0

\* polyarylethersulfone \*\* polyurethane

THE sterile, single use 63 MICRODIALYSIS CATHETER is used in deep buried flaps, subcutaneous adipose tissue, resting skeletal muscle, and for research in hepatic tissue during open surgery. It is available in two different membrane and shaft lengths for the different applications. The catheter is easily introduced into the tissue with a splitable introducer (included) and can be implanted for several days.

The catheter's inlet tubing is connected to a Microdialysis pump and the outlet tubing ends with a microvial holder where the sample is collected into microvials. The samples can be analyzed in the Microdialysis Analyzer for Glucose, Lactate, Pyruvate, Glycerol, Glutamate and Urea or sent to the laboratory for further analysis.



CAUTION: Investigational Device  
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- \* Suitable for many applications

\* Gold tip for location by CT scan
- \* Splitable Introducers are included

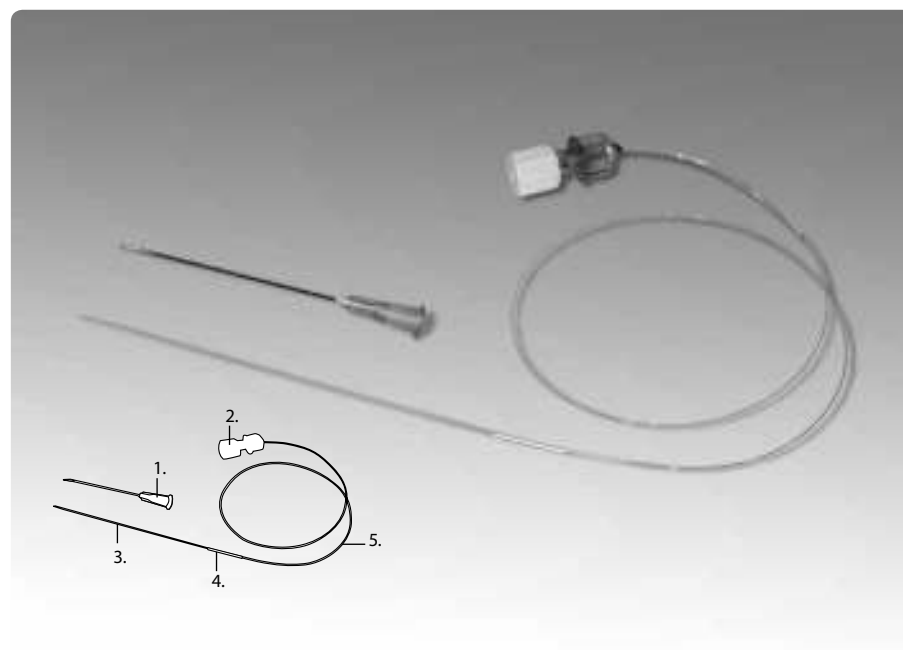
## 66 Linear Microdialysis Catheter

for use in skin, adipose, and resting skeletal muscle tissue

THE 66 LINEAR MICRODIALYSIS CATHETER is a minimally invasive sterile single use device intended for microdialysis monitoring in skin, adipose or resting skeletal muscle tissue. The catheter is available with either 20,000 or 100,000 Daltons cut off membrane. The 66 is suitable for many research applications: metabolic research, estimating the free concentration of a drug, pharmacokinetic and pharmacodynamic studies or monitoring inflammatory processes in vivo.

Insertion into the tissue is easily done with the help of a small needle introducer. The unique patented linear design makes the catheter robust and safe to use for several days. If ultrafiltration occurs when using the high cut off membrane, we recommend perfusing the catheter with a fluid containing high molecular weight substances to balance colloidal osmosis (e.g. 30g Dextran 60/1000mL).

The samples can be analyzed in the Microdialysis Analyzer for Glucose, Lactate, Pyruvate, Glutamate, Glycerol and Urea or sent to the clinical laboratory for various analyses by methods such as ELISA or HPLC.



CAUTION: Investigational Device

Limited by United States Law to Investigational Use.

To be used only for Institutional Review Board (IRB) approved or, if applicable, FDA approved studies.

- \* Available with 20 000 or 100 000 Daltons cut-off
- \* Unique Linear Microdialysis Catheter for clinical use

### ORDERING INFORMATION

#### 66 Linear Microdialysis Catheter 4/pkg

	Ref. No.
66 Linear Catheter 30 mm, 20kD includes Needle introducer	8010650
66 High Cut Off Linear Catheter 30 mm, 100kD includes Needle introducer	8010651
66 Linear Catheter 10 mm, 20kD Includes Needle introducer	8010670
66 High Cut Off Linear Catheter 10 mm, 100kD includes Needle introducer	8010671

#### Accessories

For product information on Perfusion Fluid and Syringes, see page 25-26  
Parts of the 66 Linear Microdialysis Catheter

1. Introducer needle 21 G, 50mm
2. Luer-Lock connection
3. Outlet tube
4. Dialysis membrane
5. Inlet tube

### TECHNICAL INFORMATION

Membrane cut-off: 20 000 Daltons or  
High Cut Off membrane: 100 000 Daltons

	Material	Length (mm) (mm)		Diameter (mm)
		8010650/51 8010670/71		
Membrane	PAES*	30	10	0.5
Inlet tubing	PUR**	400	400	0.38
Outlet tubing	PUR**	100	100	0.38

\* polyarylethersulfone \*\* polyurethane

# 67 Intravenous Microdialysis Catheter

for peripheral blood monitoring

ORDERING INFORMATION

67 IV Microdialysis Catheter 4/pkg

	Ref. No.
67 IV Microdialysis Catheter 46/10, includes Introducer	8050090
67 IV Microdialysis Catheter 46/20, includes Introducer	8050091
67 IV Microdialysis Catheter 46/30, includes Introducer	8050092
67 IV Microdialysis Catheter 130/10, includes Introducer	8050093

Accessories

For product information on Microvials, Microvial racks and Syringes see page 24-25.

Parts of the 67 IV Microdialysis Catheter

1. Dialysis membrane

2. Shaft

3. Liquid cross with Luer-Lock connection

4. Outlet tube

5. Vial holder
6. Microvial

7. Inlet tube

8. Luer-Lock connection

9. Peripheral Venous Catheter

TECHNICAL INFORMATION

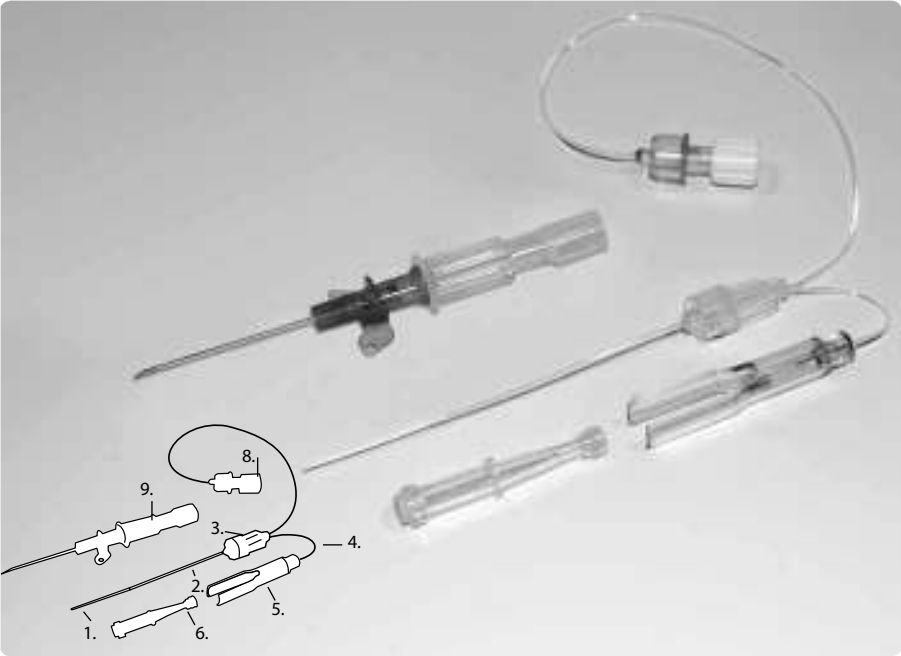
Membrane cut-off: 20 000 Daltons

	Material	Length		Diameter	
	(mm)	(mm)	(mm)	(mm)	
	8050090	8050091	8050092	8050093	
Shaft	PUR** 46	46	46	130	0.9
Membrane	PAES* 10	20	30	10	0.6
Inlet tubing	PUR** 200	200	200	200	1.0
Outlet tubing	PUR** 45	45	45	45	1.0

\* polyarylethersulfone \*\* polyurethane

THE 67 IV MICRODIALYSIS CATHETER is a sterile, single use device intended for intravenous monitoring through a standard peripheral vein catheter (PVC) for up to 72 hours.

The clean samples and possibility for frequent sampling make it ideal for research. Small substances diffuse into the catheter reflecting accurate concentrations in blood. The catheter should be perfused with a physiologic solution containing the anticoagulant dalteparin sodium to avoid clotting. The samples are collected in microvials and can be analyzed as often as every minute. The catheter forms a complete system together with the 106 or 107 Microdialysis Pump and a Microdialysis Analyzer. The catheter is also excellent for continuously monitoring the free concentrations of drugs in blood during pharmacokinetic and pharmacodynamic studies.



CAUTION: Investigational Device  
Limited by United States Law to Investigational Use.  
To be used only for Institutional Review Board (IRB) approved or, if applicable, FDA approved studies.

- \* Continuous intravenous monitoring of substances in the blood for up to 3 days
- \* Easy insertion using a standard peripheral venous catheter

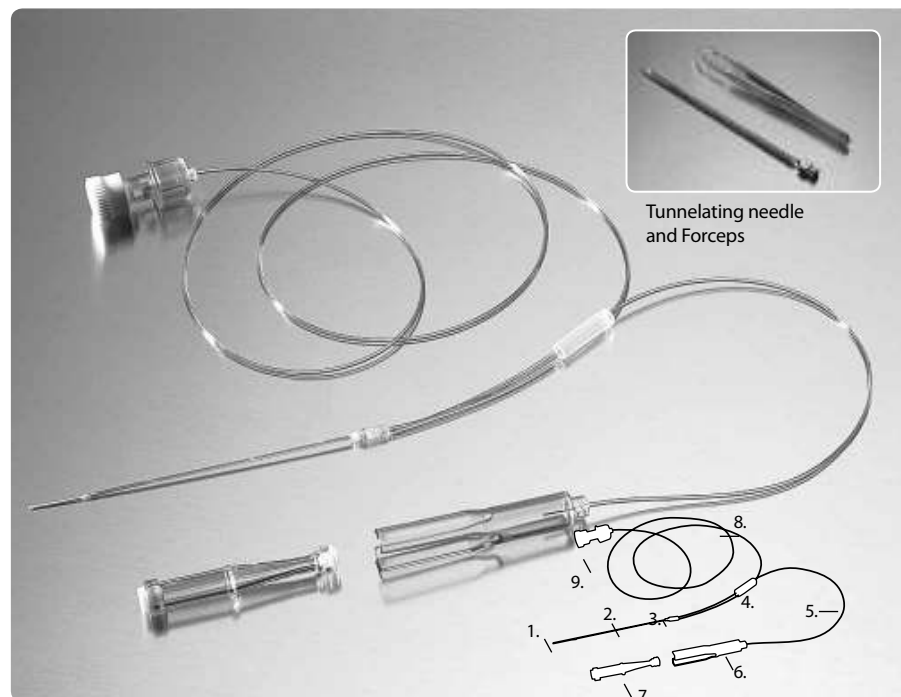


# 70 Brain Microdialysis Catheter

for use in brain tissue

THE sterile, single use 70 BRAIN MICRODIALYSIS CATHETER is a highly flexible catheter designed for implantation in brain tissue to follow brain metabolism. A selection of this model of catheters is available with different membrane and shaft lengths suitable for stereotaxic as well as manual implantation. When manually implanted in the brain, the 70 Microdialysis Catheter can be tunneled under the scalp and then inserted into the brain tissue through a hole drilled in the skull bone with the help of non-crushing forceps. The tip of the 70 Microdialysis Catheter has a gold thread, which makes it visible on a CT-scan to easily determine its position in vivo.

The catheter inlet tubing is connected to a Microdialysis Pump and the outlet ends in a microvial which collects the sample. The samples can be analyzed in the Microdialysis Analyzer for Glucose, Lactate, Pyruvate, Glycerol and Glutamate or sent to the laboratory for further analysis.



10mm membrane sizes are cleared for use in the USA as part of the neuromonitoring system.

CAUTION: All other uses for that catheter and the others noted below (20 and 30 mm membranes) are not FDA cleared and therefore in the USA may only be used with IRB approval or with an IDE from the FDA.

- \* High biocompatibility
- \* Designed to monitor metabolic changes
- \* Gold tip for location by CT scan

## ORDERING INFORMATION

### 70 Brain Microdialysis Catheter 4/pkg

	Ref. No.
70 Brain Microdialysis Catheter 60/10	P000049
70 Brain Microdialysis Catheter 60/20	P000080
70 Brain Microdialysis Catheter 60/30	P000081
70 Brain Microdialysis Catheter 100/10	P000050
70 Brain Microdialysis Catheter 90/20	P000051
70 Brain Microdialysis Catheter 80/30	P000052

### Accessories

Tunneling needle	P000055
Forceps	P000056

For product information on Microvials, Microvial racks, Syringes, Perfusion Fluid, Tunneling needle and Forceps, see page 24-27.

Parts of the 70 Brain Microdialysis Catheter

1. Dialysis membrane	6. Vial holder
2. Shaft	7. Microvial
3. Liquid cross	8. Inlet tube
4. Stopper	9. Luer-Lock connection
5. Outlet tube	

## TECHNICAL INFORMATION

Membrane cut-off: 20 000 Daltons

	Material	(mm)	Length (mm)	(mm)	Diameter (mm)
		P000049	P000080	P000081	
Shaft	PUR**	60	60	60	0.9
Membrane	PA*	10	20	30	0.6
Inlet tubing	PUR**	600	600	600	1.0
Outlet tubing	PUR**	220	220	220	1.0
		P000050	P000051	P000052	
Shaft	PUR**	100	90	80	0.9
Membrane	PA*	10	20	30	0.6
Inlet tubing	PUR**	600	600	600	1.0
Outlet tubing	PUR**	220	220	220	1.0

\* polyamide \*\* polyurethane

# 70 Microdialysis Bolt Catheter

for use in brain tissue

## ORDERING INFORMATION

### 70 Microdialysis Bolt Catheter 4/pkg

	Ref. No.
70 Microdialysis Bolt Catheter 130/10	P000131

### Accessories

For product information on Microvials, Microvial racks, Syringes and Perfusion Fluid, see page 24-25.

#### Parts of the 70 Microdialysis Bolt Catheter

1. Dialysis membrane

2. Shaft

3. Liquid cross with Luer-Lock connection

4. Outlet tube
5. Vial holder

6. Microvial

7. Inlet tube

8. Luer-Lock connection

## TECHNICAL INFORMATION

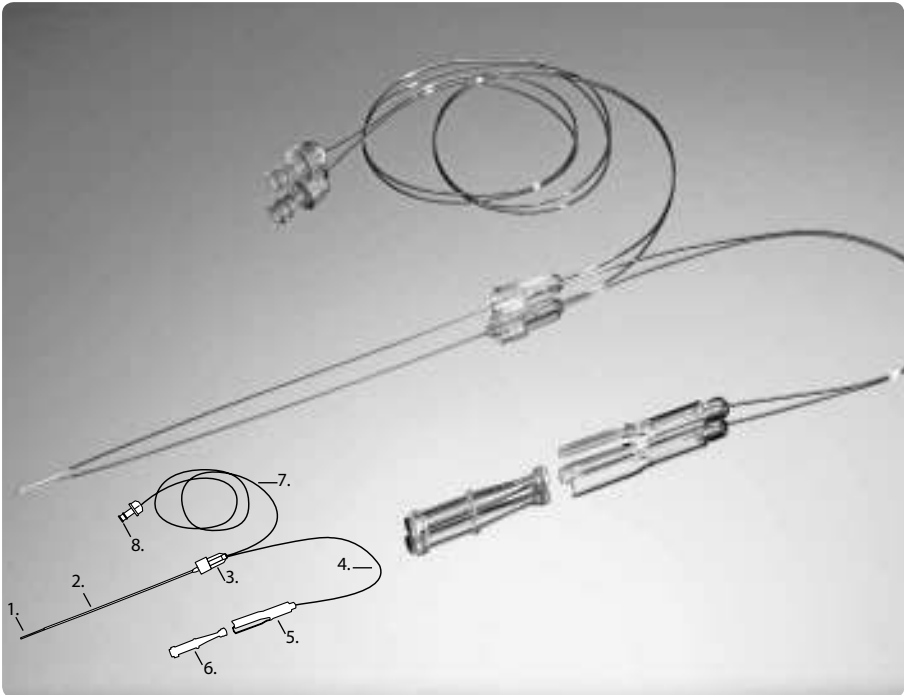
Membrane cut-off: 20 000 Daltons

	Material	Length (mm)	Diameter (mm)
Shaft	PUR**	130	0.9
Membrane	PA*	10	0.6
Inlet tubing	PUR**	600	1.0
Outlet tubing	PUR**	220	1.0

\* polyamide \*\* polyurethane

THE sterile, single use 70 MICRODIALYSIS BOLT CATHETER is designed for implantation in brain tissue through an intracranial access device that has been fixed to the skull. The catheter's Luer-Lock fitting connects to a port on an intracranial access device from Integra. The catheter's steel reinforcement prevents flow obstruction when the compression screw of the bolt is tightened. The shaft length of the microdialysis catheter is 130 mm and the dialyzing membrane length is 10 mm.

The catheter inlet tubing is connected to a Microdialysis Pump and the outlet ends in a microvial which collects the sample. The samples can be analyzed in the Microdialysis Analyzer for Glucose, Lactate, Pyruvate, Glycerol and Glutamate or sent to the laboratory for further analysis. This catheter is FDA-cleared for use in humans as part of the Neuromonitoring System.

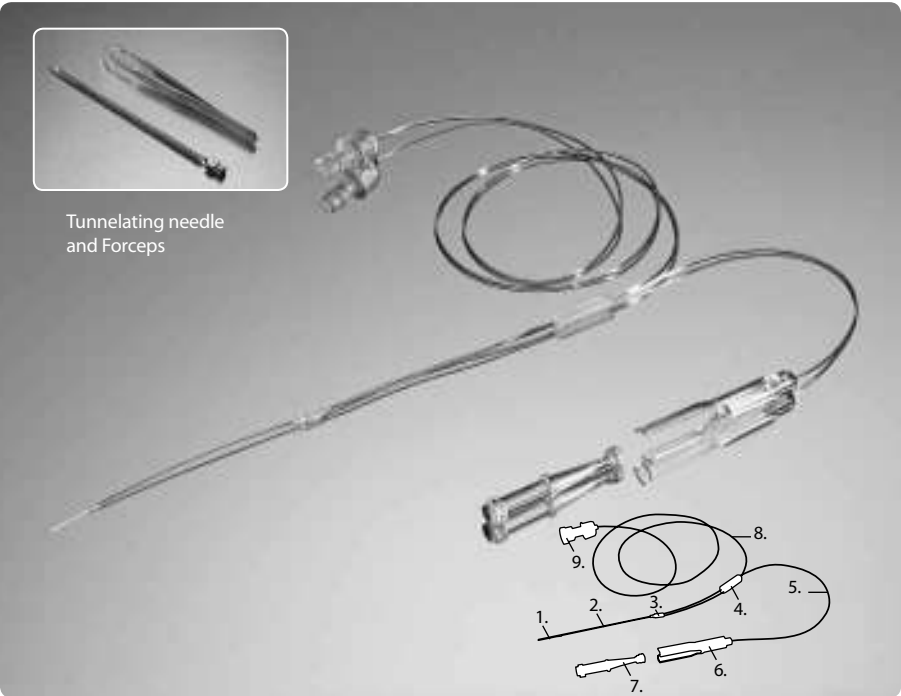


- \* Implanted through a lumen in an intracranial access bolt from Integra
- \* Gold tip for location by CT scan

# 71 High Cut-Off Brain Microdialysis Catheter

allows sampling of large molecules

THE sterile, single use 71 HIGH CUT-OFF BRAIN MICRODIALYSIS CATHETER is minimally invasive and designed for implantation in brain tissue through tunnelation. The large pore size of this catheter allows diffusion of large molecules such as cytokines and inflammatory markers. If ultrafiltration occurs we recommend perfusing the catheter with a fluid containing high molecular weight substances to balance colloidal osmosis (e.g. Dextran). The catheter inlet tubing is connected to a Microdialysis Pump and the outlet ends in a microvial which collects the sample.



CAUTION: Investigational Device  
Limited by United States Law to Investigational Use.  
To be used only for Institutional Review Board (IRB) approved or, if applicable, FDA approved studies.

- \* Designed for use together with the portable 106 and 107 Microdialysis Pump
- \* With gold tip, visible on CT   \* Used to recover large molecules such as cytokines

## ORDERING INFORMATION

71 High Cut-Off Brain Microdialysis Catheter 4/pkg		Ref. No.
71 High Cut-Off Brain Microdialysis Catheter 60/10		8010320
71 High Cut-Off Brain Microdialysis Catheter 60/20		8010331
71 High Cut-Off Brain Microdialysis Catheter 60/30		8010337

## Accessories

For product information on Microvials, Microvial racks, Syringes, Tunnelating needle and Forceps, see page 24-27.

Parts of the 71 High Cut-Off Brain Microdialysis Catheter

- |                      |                         |
|----------------------|-------------------------|
| 1. Dialysis membrane | 6. Vial holder          |
| 2. Shaft             | 7. Microvial            |
| 3. Liquid cross      | 8. Inlet tube           |
| 4. Stopper           | 9. Luer-Lock connection |
| 5. Outlet tube       |                         |

## TECHNICAL INFORMATION

Membrane cut-off: 100 000 Daltons

	Material (mm)	Length (mm)			Diameter (mm)
		8010320	8010331	8010337	
Shaft	PUR**	60	60	60	0.9
Membrane	PAES*	10	20	30	0.5
Inlet tubing	PUR**	600	600	600	1.0
Outlet tubing	PUR**	220	220	220	1.0

\* polyarylethersulfone \*\* polyurethane

# Custom Made Catheters

## ORDERING INFORMATION

### Custom Made Catheters

Ref. No.

Custom Made Catheters

P000046

Prior to the acceptance of an order for custom catheters, the specifications must be submitted for approval.

CUSTOM MADE CATHETERS can be produced for many advanced Microdialysis applications. The approval process includes an assessment of sterility validation based on the proposed specifications of the custom made catheter. Custom made production takes 6-12 weeks from approval.



CAUTION: Investigational Device  
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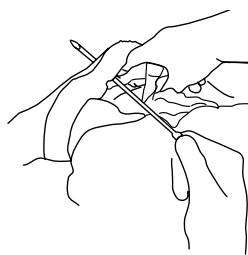
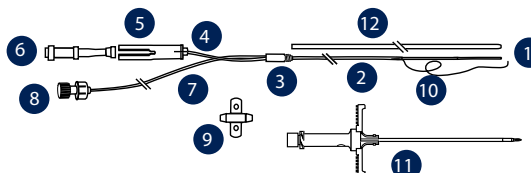


# Implantation of catheters

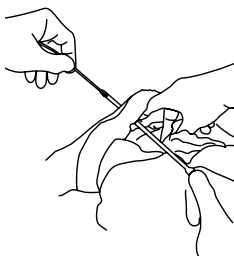
## 61 Hepatic Microdialysis Catheter

for metabolic research in liver tissue

1. Dialysis membrane
2. Shaft
3. Liquid cross
4. Outlet tube
5. Vial holder
6. Microvial
7. Inlet tube
8. Luer-Lock connection
9. Fixating device (PEBAX®)
10. Suture
11. Splitable Introducer
12. Protection tube

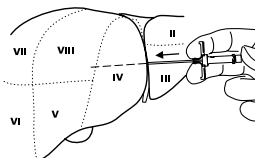
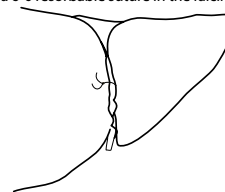


1. Introduce the tunneling needle lateral to the rectus muscle, preferably in the linea semilunaris, from the inside of the abdominal wall going out through the skin.

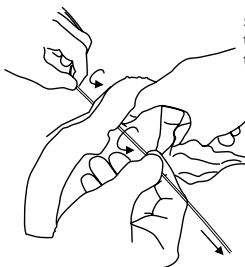


2. Insert the catheter, with the protective tubing on, through the tip of the tunneling needle.

3. Place a 6-0 resorbable suture in the falciform ligament

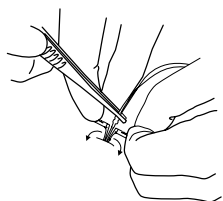
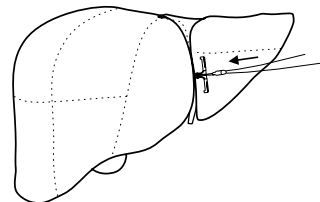


4. Insert the introducer in the middle of the falciform ligament, in direction to segment IV and VIII as close to the suture in the ligament as possible.

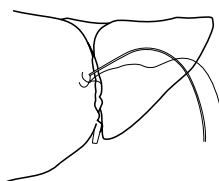


5. Unscrew the protective tubing on the catheter by turning it counterclockwise.

6. Remove the needle from the splitable Introducer. Carefully insert the catheter.



7. Grasp the tabs of the splitable tube (three hands needed) and pull the tabs apart, away from the indwelling catheter, until the tube splits down its entire length and is removed in two pieces.

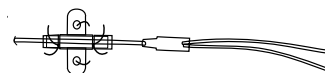


8. Keep holding the catheter in place with the forceps. Tie the suture already placed in the falciform ligament to the suture of the catheter. Tie the catheter as tightly as possible to the ligament. Cut off the excess suture material.

9. Place the fixation device (white plastic wing) close to the insertion site and secure it to the catheter by suturing over the grooves/indentations.

10. Suture the fixation device to the skin through the two holes.

11. Put a protective bandage over the insertion site, e.g. Tegaderm®, OpSite® or similar.

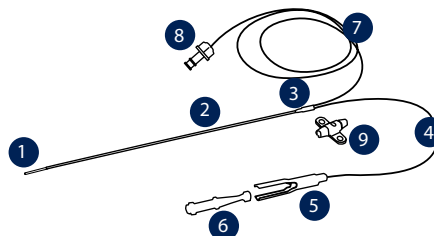


# Implantation of catheters

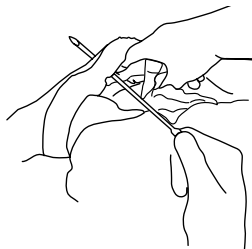
## 62 Microdialysis Catheter

for research in intraperitoneal cavity

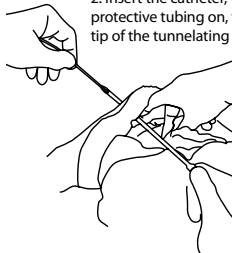
1. Dialysis membrane
2. Shaft
3. Liquid cross
4. Outlet tube
5. Vial holder
6. Microvial
7. Inlet tube
8. Luer-Lock connection
9. Fixating device (PEBAX)



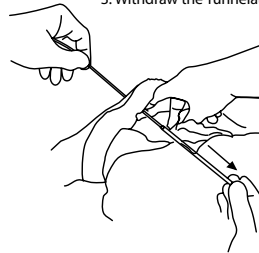
1. Introduce the tunneling needle lateral to the rectus muscle, preferably in the linea semilunaris, from the inside of the abdominal wall going out through the skin.



2. Insert the catheter, with the protective tubing on, through the tip of the tunneling needle.

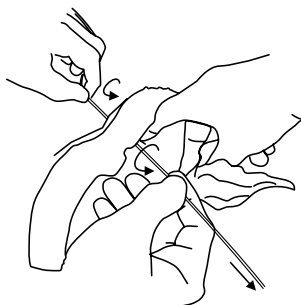


3. Withdraw the Tunneling needle.

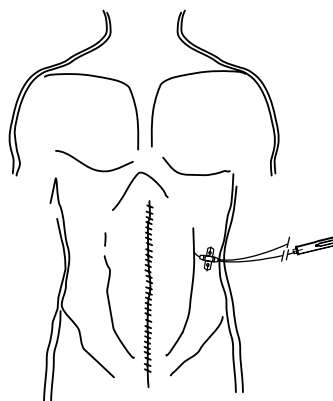


4. Unscrew the protective tubing on the catheter by turning it counterclockwise.

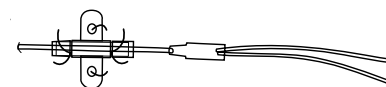
5. Place the membrane of the catheter close to the anastomosis or in the region of interest.



6. Place the fixation device (white plastic wing) close to the insertion site and secure it to the catheter by suturing over the grooves/indentations.



7. Suture the fixation device to the skin through the two holes.

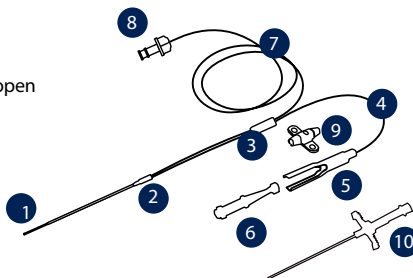


# Implantation of catheters

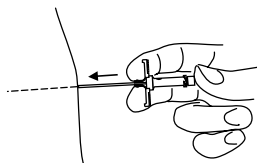
## 63 Microdialysis Catheter

for resting skeletal muscle, subcutaneous adipose tissue and research in liver during open surgery

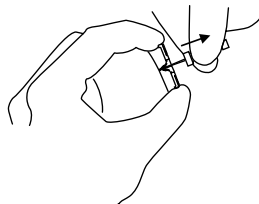
1. Dialysis membrane
2. Shaft
3. Liquid cross
4. Outlet tube
5. Vial holder
6. Microvial
7. Inlet tube
8. Luer-Lock connection
9. Fixating device (PEBAX®)
10. Splitable Introducer



1. Break the handles of the Splitable Introducer before insertion to avoid damaging the tissue.

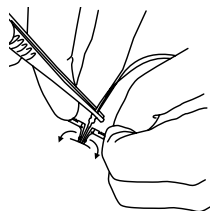


2. Insert the Introducer completely to the handle of the splitable tube into the tissue.



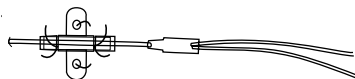
3. Remove the Introducer needle carefully while keeping the splitable tube in position. Do not reinsert the introducer needle after withdrawal.

4. Carefully insert the Microdialysis Catheter into the splitable tube. Do not touch the white membrane of the catheter.



5. Grasp the tabs of the splitable tube (three hands needed) and pull the tabs apart, away from the indwelling catheter, until the tube splits down its entire length.

6. If needed, carefully anchor the catheter. Please use the fixation devices included in the package.



7. If needed the Microdialysis Catheter can also be fixated to the skin by sutures around the stopper on the catheter.

8. Cover the insertion site with a protective bandage.

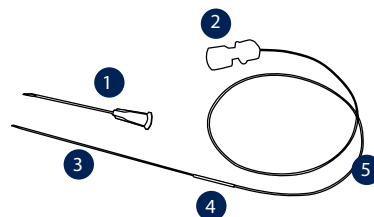


# Implantation of catheters

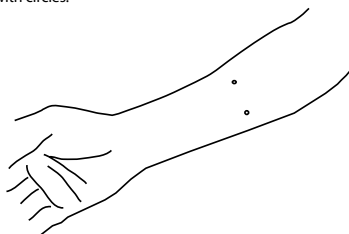
## 66 Linear Microdialysis Catheter

for use in skin, adipose, and resting skeletal muscle tissue

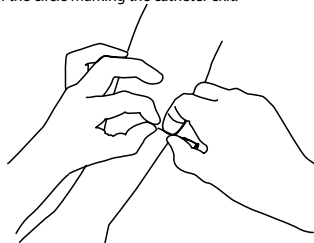
1. Introducer needle 21 G, 50mm 2. Luer-Lock connection  
3. Outlet tube 4. Dialysis membrane 5. Inlet tube



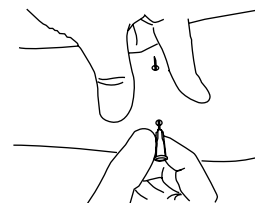
1. Make marks for catheter entrance and exit holes with circles.



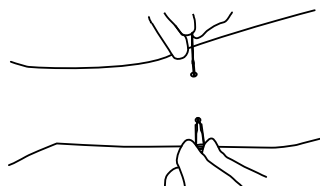
2. Take the introducer cannula and insert it through the center of the circle marking the catheter exit.



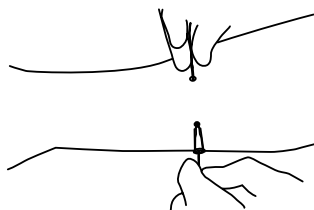
3. Continue through the skin to the center of the marked catheter entrance hole. Avoid penetration of actual markings.



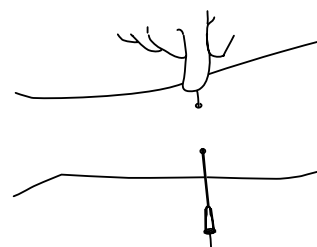
4. Remove the catheter from the protective tube and guide the catheter gently into the sharp end of the introducer cannula.



5. Push it carefully through the introducer cannula until it appears at the opposite side of the cannula and continue until the membrane is in position. Important: Be very gentle when inserting the membrane into the introducer cannula.



6. When the catheter and membrane is in position, the introducer cannula is removed, after which the catheter is fixed to the skin.

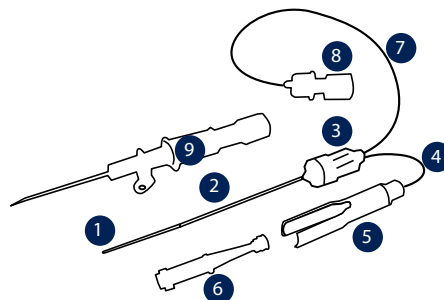


# Implantation of catheters

## 67 IV Microdialysis Catheter

for peripheral blood monitoring

1. Dialysis membrane 2. Shaft 3. Liquid cross with Luer-Lock connector 4. Outlet tube 5. Vial holder 6. Microvial 7. Inlet tube 8. Luer-Lock connection 9. Peripheral Venous Catheter (PVC)



1. Connect the inlet tubing of the 67 IV MD catheter to the syringe and place it in a 106/107 Pump. Close the lid to start the pump.

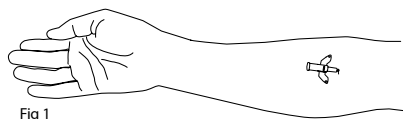


Fig 1

2. Insert the peripheral venous catheter delivered with 67 IV Microdialysis catheter in a peripheral vein according to normal hospital routines (Fig 1). Observe that the peripheral venous catheter (PVC) delivered with the 67 IV Microdialysis catheter must be used. Flush the PVC with a saline solution.

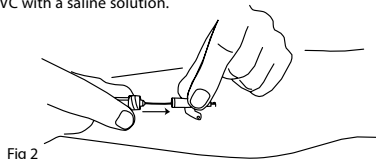


Fig 2

3. Unscrew the protective tubing and remove it from the 67 IV Microdialysis catheter. Insert 67 IV Microdialysis catheter through the peripheral venous catheter (Fig 2) and fixate it by attaching the luer-lock of the 67 IV Microdialysis catheter to the luer-lock of the peripheral venous catheter (Fig 3).

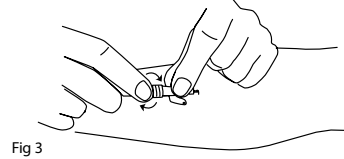


Fig 3

4. Connect the catheter to the pump. Attach the pump to the patient by a bandage or similar

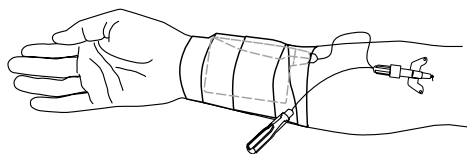


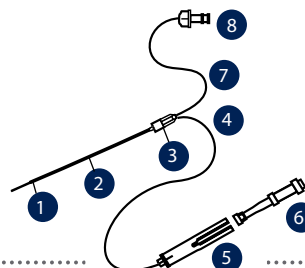
Fig 4

# Implantation of catheters

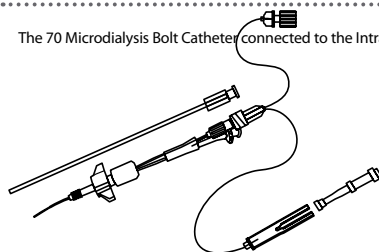
## 70 Microdialysis Bolt Catheter

for microdialysis in brain tissue.

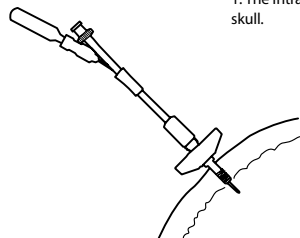
1. Dialysis membrane
2. Shaft
3. Liquid cross with Luer-Lock™ Connection
4. Outlet tube
5. Vial holder
6. Microvial
7. Inlet tube
8. Luer-Lock connection



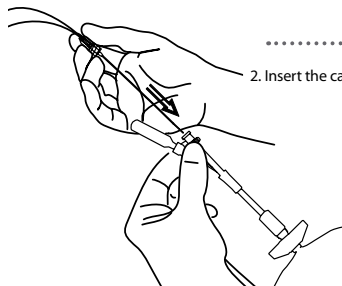
The 70 Microdialysis Bolt Catheter connected to the Intracranial Access Bolt Kit (from Integra).



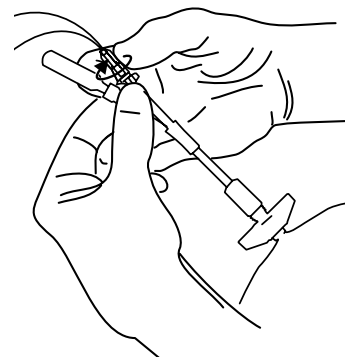
1. The Intracranial Access Bolt Kit (from Integra) fixed to the skull.



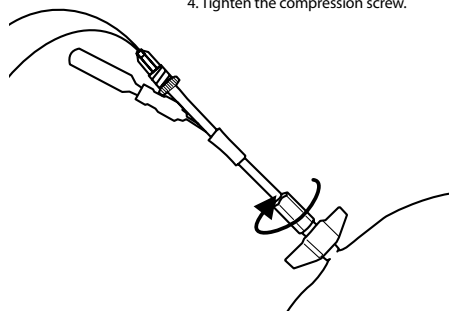
2. Insert the catheter in the microdialysis port.



3. Fix the catheter at the Luer Lock.



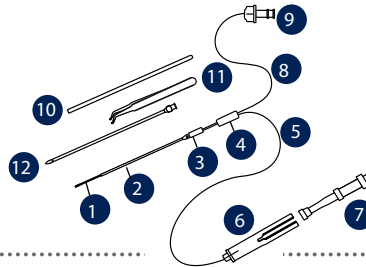
4. Tighten the compression screw.



# Implantation of catheters

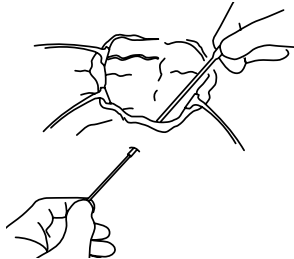
## 70/71 Brain Microdialysis Catheter

for microdialysis in brain tissue. Implantation during surgery.

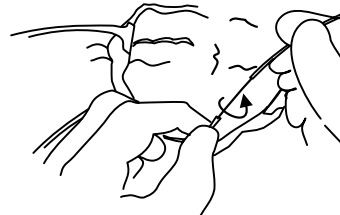


1. Dialysis membrane 2. Shaft 3. Liquid cross 4. Stopper 5. Outlet tube
6. Vial holder 7. Microvial 8. Inlet tube 9. Luer-Lock connection
10. Protection tube 11. Forceps - accessory
12. Tunneling needle - accessory

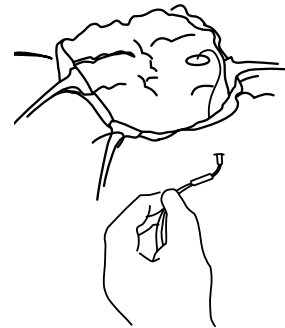
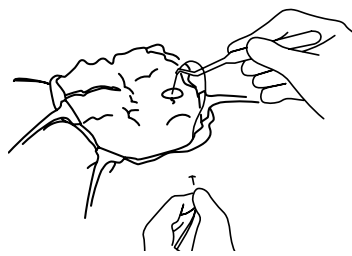
1. Pass the catheter through the tunneling tube.



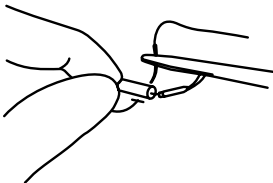
2. Remove the protection tube by unscrewing it from the liquid cross.



3. Grip the catheter just proximal to the membrane with the microdialysis forceps. Pass it into the brain tissue through a hole made in the meninges.



4. Stretch the catheter and fix it firmly to the scalp by suturing around the stopper.

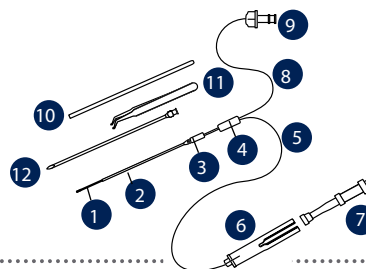


# Implantation of catheters

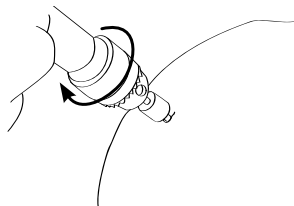
## 70/71 Brain Microdialysis Catheter

for microdialysis in brain tissue. Percutaneous Implantation.

1. Dialysis membrane
2. Shaft
3. Liquid cross
4. Stopper
5. Outlet tube
6. Vial holder
7. Microvial
8. Inlet tube
9. Luer-Lock connection
10. Protection tube
11. Forceps - accessory
12. Tunneling needle - accessory



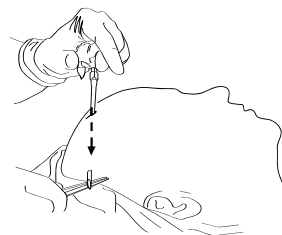
1. Drill a small hole.



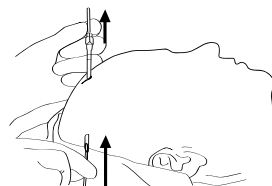
2. Perforate the meninges (including the Pia Mater).



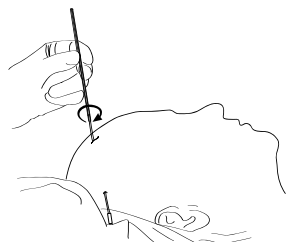
3. Create a tunnel under the skin using the tunneling needle.



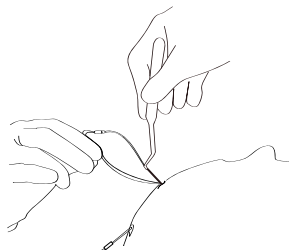
4. Insert the 70 Brain Microdialysis catheter into the beveled end of the tunneling needle, then remove the tunneling needle.



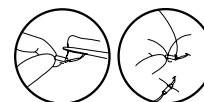
5. Unscrew the protection tube from the catheter.



6. Insert the catheter with the forceps through the hole made in the meninges.



7. Stretch the catheter inlet and outlet tubing to externalize the excess and fix it firmly to the scalp by suturing around the stopper.



# 106 Microdialysis Pump

a portable, fixed-flow, battery-operated pump

## ORDERING INFORMATION

### 106 Microdialysis Pump

	Ref. No.
106 Microdialysis Pump	P000003

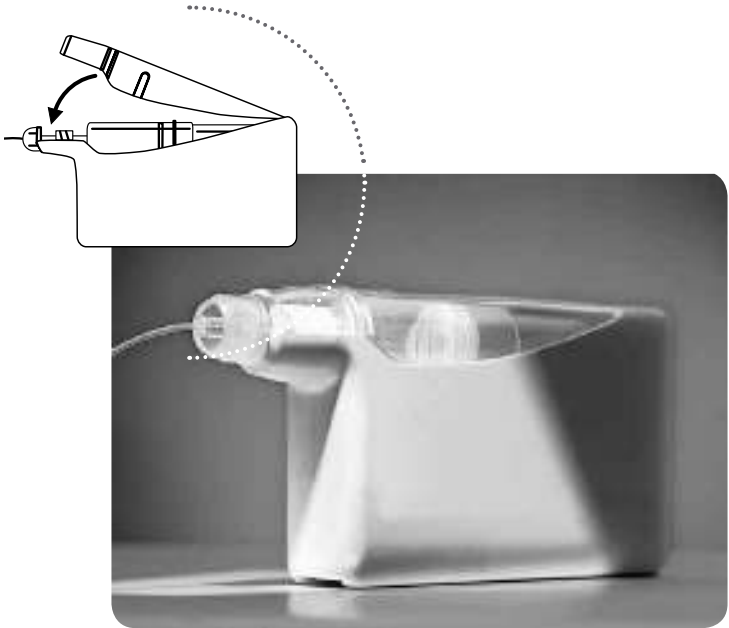
### Accessories

MD Pump Kit, Peripheral Tissue	8003790
MD Pump Kit, Brain Tissue	8003791
Syringe, 20/pkg	8010191
Battery, 2x3 V	8001788
Perfusion Fluid, T1, 5 mL, 10/pkg	P000034
Perfusion Fluid, CNS, 5 mL, 10/pkg	P000151

## TECHNICAL INFORMATION

Normal Flow rate: Fixed, 0.3 µL/min  
Flush flow: 15 µL/min  
Dimension: 90 x 50 x 20 mm  
Weight: 70g (incl. Battery)  
Battery: 6V Silver oxide  
Casing: ABS plastic, splash proof  
Operating temperature: +5 to +40°C  
Alarms: Error, Low battery

THE 106 MICRODIALYSIS PUMP has been developed to function together with Microdialysis Catheters. Portable and battery-driven, this small lightweight microprocessor-controlled syringe pump is very easy to use. The syringe, filled with 2.5 mL of a sterile perfusion fluid and connected to a catheter, is placed in the carriage of the pump. When the lid is closed, the pump automatically starts a flush sequence (15 µL/min) for the first 5 minutes to fill the lines. Thereafter the flow rate decreases automatically to 0.3 µL/min. Colored LEDs indicate function, enabling the user to easily oversee the operation.



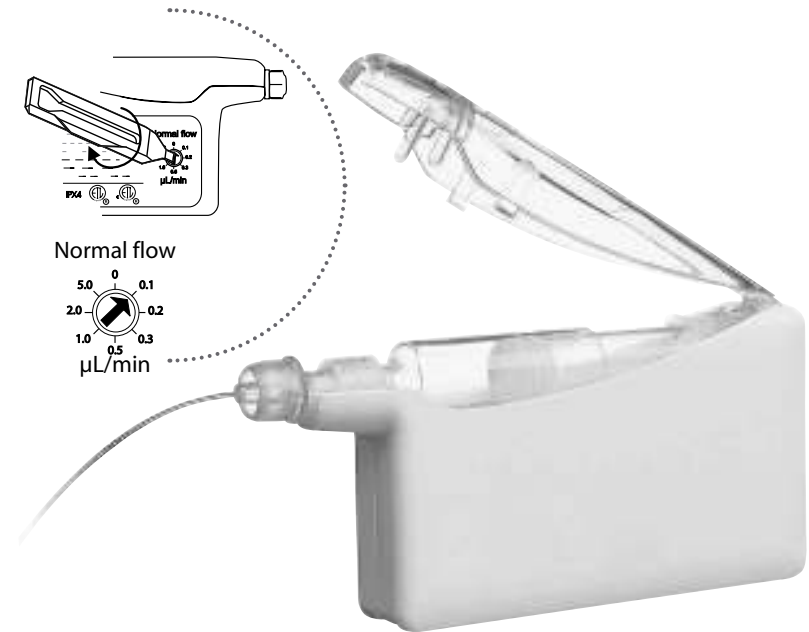
- \* Portable, small and lightweight
- \* Easy to handle
- \* Self-controlled with LED function signals
- \* Splash proof

# 107 Microdialysis Pump

a portable, adjustable flow, battery-operated pump

THE 107 MICRODIALYSIS PUMP is a unique 2.5 mL syringe pump with flexibility in flow rate that enables the user to change the flow for different purposes: low flow rate for high recovery of low molecular weight substances in a tissue, or high flow rate for blood flow measurements and for more frequent sampling intervals. The operating flow is adjustable to eight different settings: 0, 0.1, 0.2, 0.3, 0.5, 1.0, 2.0 and 5.0  $\mu\text{L}/\text{min}$ .

The 107 Microdialysis Pump is a portable battery-driven pump and very easy to use. The syringe is filled with 2.5 mL of sterile perfusion fluid, connected to the microdialysis catheter and then placed in the pump. When the pump lid is closed, a 5-minute flush cycle begins and is followed by an automatic decrease to the pre-set operating rate.



**CAUTION:** Investigational Device  
 Limited by United States Law to Investigational Use.  
 To be used only for Institutional Review Board (IRB) approved or, if applicable, FDA approved studies.

- \* Portable, small and lightweight
- \* Easy to handle
- \* Self-controlled with LED function signals
- \* Splash proof
- \* Variable flow

## ORDERING INFORMATION

### 107 Microdialysis Pump

	Ref. No.
107 Microdialysis Pump	P000127

### Accessories

MD Pump Kit, Peripheral Tissue	8003790
MD Pump Kit, Brain Tissue	8003791
Syringe, 20/pkg	8010191
Battery, 2 x 3V	8001788
Perfusion Fluid, T1, 5 mL,10/pkg	P000034
Perfusion Fluid, CNS, 5 mL,10/pkg	P000151

## TECHNICAL INFORMATION

Normal Flow: Variable, 0.1-5  $\mu\text{L}/\text{min}$ , 8 settings  
 Flush flow: 15  $\mu\text{L}/\text{min}$   
 Dimension: 90 x 50 x 20 mm  
 Weight: 70g (incl. battery)  
 Battery: 6V Silver oxide  
 Casing: ABS plastic, splash proof  
 Operating temperature: +5 to +40°C  
 Alarms: Error, Low battery

## Accessories

### Microvials and Microvial Racks

#### ORDERING INFORMATION

##### Microvials

		Ref. No.
Microvials	250/pkg	P000001

##### Microvial Racks

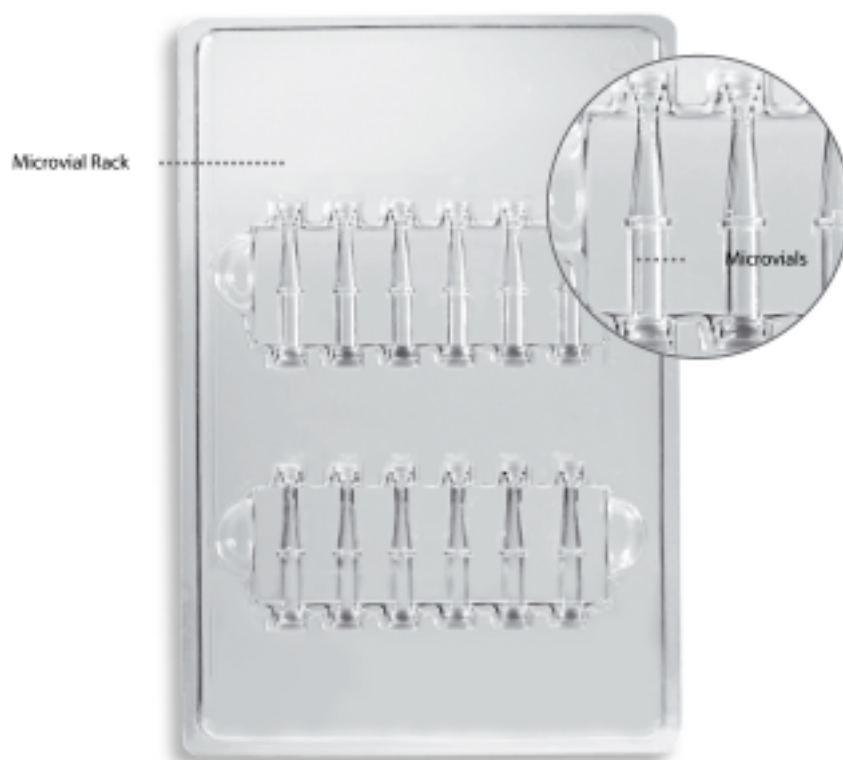
		Ref. No.
Microvial Rack, 12/pkg		P000028

##### Microvial Racks, Sterile

		Ref. No.
Microvials in a rack, 12 x 4		P000154

**MICROVIALS** are designed to collect micro-volume samples and minimize evaporation. Each vial holds 200  $\mu$ L. If needed sterile microvials are packed and sold in racks for use under sterile conditions.

**MICROVIAL RACKS.** To minimize evaporation, samples in microvials can be placed in a Microvial Rack prior to storage in the refrigerator or freezer. The rack can store and close 12 microvials and facilitate the logistics of sample handling.





## Accessories

### Syringe and Perfusion Fluid

THE SYRINGE is specially designed for the 106 and 107 Microdialysis Pumps. The syringe holds 2.5 mL of Perfusion Fluid.



PERFUSION FLUID is an isotonic sterile solution developed specifically for microdialysis probe and catheter perfusion. Perfusion Fluids are available for use in both the central nervous system (CNS) and peripheral tissue (T1). The fluid is conveniently packaged in glass ampoules, 5 mL each, sterile and ready to use.



#### ORDERING INFORMATION

##### Syringe

	Ref. No.
Syringe 20/pkg	8010191

##### Perfusion Fluid

	Ref. No.
Perfusion Fluid T1 10/pkg, 5 mL glass ampoules	P000034

##### Contents:

NaCl	147 mmol/L
KCl	4 mmol/L
CaCl <sub>2</sub>	2.3 mmol/L

Total chloride content:  
155.6 mmol/L

Perfusion Fluid CNS 10/pkg, 5 mL glass ampoules	P000151
--	---------

##### Contents:

NaCl	147 mmol/L
KCl	2.7 mmol/L
CaCl <sub>2</sub>	1.2 mmol/L
MgCl <sub>2</sub>	0.85 mmol/L

Total chloride content:  
153.8 mmol/L

## Accessories

## Microdialysis Pump Kit

## ORDERING INFORMATION

## MD Pump Kit, Peripheral Tissue

Ref. No.

MD Pump Kit, Peripheral Tissue 8003790  
 1 106/107 Syringe, 1 battery,  
 1 Perfusion Fluid T1

## MD Pump Kit, Brain Tissue

MD Pump Kit, Brain Tissue 8003791  
 1 106/107 Syringe, 1 battery,  
 1 Perfusion Fluid CNS

## MICRODIALYSIS PUMP KIT, Peripheral Tissue

This Pump Kit includes the accessories needed for single patient microdialysis monitoring in peripheral tissue. The kit contains a syringe, a battery and a T1 perfusion fluid ampoule.

## MICRODIALYSIS PUMP KIT, Brain Tissue

This Pump Kit includes the accessories needed for single patient microdialysis monitoring in brain tissue. The kit contains a syringe, a battery and a CNS perfusion fluid ampoule.



## Accessories

## Splitable Introducer, Tunneling Needle and Forceps

THE SPLITABLE INTRODUCER is intended for easy insertion of the 61 Hepatic Microdialysis Catheter and the 63 Microdialysis Catheter



TUNNELING NEEDLE AND FORCEPS. A tunneling needle and a special forceps simplify the insertion when using the Brain Microdialysis Catheters. The tunneling needle is also used to introduce the catheter through the abdominal wall during Gastro Intestinal and Transplant Surgery.



## ORDERING INFORMATION

## Splitable Introducer SI-2

4/pkg

Ref. No.

Splitable Introducer SI-2

8010343

## TECHNICAL INFORMATION

	Material	Length (mm)	ID (OD) (mm)
Splitable tube	HDPE*	74	1.0 (1.5)
Cannula	Stainless Steel	77	(1.0)

\* High-density polyethylene

## Tunneling Needle &amp; Forceps

Ref. No.

Tunneling Needle, 1/pkg  
Forceps, 1/pkgP000055  
P000056

## TECHNICAL INFORMATION

	Material	Length (mm)	ID (OD) (mm)
Tunneling Needle	Stainless Steel	139	3.0 (3.5)
Forceps	Stainless Steel	118	

# ISCUS<sup>flex</sup> Microdialysis Analyzer

for point-of-care and advanced research

## ORDERING INFORMATION

### ISCUS<sup>flex</sup> Microdialysis Analyzer

	Ref. No.
ISCUS <sup>flex</sup> Microdialysis Analyzer	8003295
ISCUS <sup>flex</sup> Microdialysis Analyzer, Research For research use only	8003296
Includes: ICUpilot <sup>TM</sup> Software	

NOTE: This product may not be approved by your national regulatory authorities. Please contact your local representative for further information

## TECHNICAL INFORMATION

Weight: 29 lbs/13 kg  
 Voltage: 100-240 V~, 50/60 Hz  
 Power consumption: 100 VA  
 Dimensions: 430 (H) x 350 (W) x 270 (D) mm  
 Type of protection: Class 1, Type B  
 Measurement principle: Kinetic enzymatic analyzer  
 Vials: Microvials, 300 µL glass vials  
 Samples: Microdialysates  
 Sample volume used: 0.2 - 2 µL/analysis  
 (depending on analyte)  
 Min. sample volume: Sum of sample volumes  
 per analyte + 2 µL  
 Reagent consumption: <15 µL/analysis  
 (depending on analyte)  
 Pipetting imprecision: < 2 % (0.5 µL)  
 rel. standard deviation  
 Calibration: Automatic (every 6 hrs)  
 Warm-up time: 10 minutes  
 Measuring time: 30 seconds  
 Time per test: 60 - 90 seconds  
 Throughput: 30 measurements per hour  
 Detector type: Single beam filter photometer  
 Light source: Class 1M LED  
 Wavelengths: 375 and 530 nm  
 Detector cell temperature: 99°F/37°C  
 Detector cell: Capillary flow cell 10 mm, 2 µL  
 Assay imprecision: <4 % rel. standard deviation  
 for Control Sample Normal  
 Assay inaccuracy: <10 % for Control Sample Normal

ISCUS<sup>flex</sup> is a Microdialysis Analyzer for point-of-care and advanced research. This analyzer uses enzymatic reagents and colorimetric measurements to monitor tissue chemistry from within microdialysis samples taken from virtually any tissue or organ in the body.

The analyzer is easy to operate by medical professionals and researchers alike. Up to six different reagents (glucose, lactate, pyruvate, glycerol, glutamate, and urea) provide unique opportunities for early detection of metabolic crisis and ischemia and to guide therapeutic interventions. The analysis results are displayed as trend curves for easy and fast interpretation. For comparison with other monitoring data, the unique ICUpilot<sup>TM</sup> software is included for installation on a separate computer.

ISCUS<sup>flex</sup> combines reliability and flexibility. It offers the opportunity to monitor several subjects at a time and with a capacity of 16 vials, the ISCUS<sup>flex</sup> offers batch analysis for advanced research. The throughput of the analyzer is 30 measurements per hour.



- ✱ Easy to operate graphical user interface ✱ Quick one-button 2 minute analysis
- ✱ Batch capacity of 16 samples ✱ Less than 2 µL of sample required per analysis
- ✱ Automatic calibration and controls

# ISCUS<sup>flex</sup> Microdialysis Analyzer

for point-of-care and advanced research

## ORDERING INFORMATION

### Accessories

	Ref. No.
Reagent Set A, Incl.	8002163
Reagent Glucose 1 x 6 mL	
Reagent Lactate 1 x 6 mL	
Reagent Pyruvate 1 x 6 mL	
Reagent Glycerol 1 x 6 mL	
Calibrator A 1 x 6 mL	
Reagent Set B, Incl.	8002164
Reagent Glucose 1 x 6 mL	
Reagent Lactate 1 x 6 mL	
Reagent Pyruvate 1 x 6 mL	
Reagent Glycerol 1 x 6 mL	
Reagent Glutamate 1 x 4 mL	
Calibrator A 1 x 6 mL	
Reagent Set C, Incl.	8002165
Reagent Glucose 1 x 6 mL	
Reagent Lactate 1 x 6 mL	
Reagent Pyruvate 1 x 6 mL	
Calibrator A 1 x 6 mL	
Reagent kit, Incl.	P000011
Reagent Glucose 1 x 6 mL	
Reagent Lactate 1 x 6 mL	
Reagent Pyruvate 1 x 6 mL	
Reagent Glycerol 1 x 6 mL	
Calibrator A 1 x 6 mL	
LPG kit, Incl.	8010361
Reagent Glucose 1 x 6 mL	
Reagent Lactate 1 x 6 mL	
Reagent Pyruvate 1 x 6 mL	
Calibrator A 1 x 6 mL	
Glucose Reagent, 6 mL, 5/pkg	P000023
Lactate Reagent, 6 mL, 5/pkg	P000024
Pyruvate Reagent, 6 mL, 5/pkg	P000063
Glycerol Reagent, 6 mL, 5/pkg	P000025
Glutamate Reagent, 4 mL, 5/pkg	P000064
Urea Reagent, 6 mL, 5/pkg	P000026
Calibrator A 6 mL, 10/pkg	P000057
Control Samples 5 mL,	8010201
2 levels 2 x 5/pkg	
Control Samples for US 5 mL,	8010306
2 levels 2 x 5/pkg	
Rinsing Fluid for Analyzer, 8 x 0.5 L	8002171
Waste Bottles, 0.5L 8/pkg	8002161
Thermal Print Paper roll, 4/pkg	8002162
Sample Cannula	8001721
Secure Digital Memory Card	8002360
Vial Glass 300µL*	7431007
Vial Adapter	P000114
ISCUS Vial Cassette	8003409
ISCUS Maintenance kit	8002792

\* Needs to be bought by CMA Microdialysis AB  
 For product information on Reagents, see page 30-31  
 For product information on LABpilot™ and ICUpilot™, see page 32



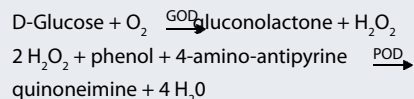
## Reagents

### Glucose

Glucose oxidase method for analysis of microdialysates

#### Measuring principle

Glucose is enzymatically oxidized by glucose oxidase (GOD). The hydrogen peroxide formed reacts with phenol and 4-amino-antipyrine. This reaction is catalyzed by peroxidase (POD) and yields the red-violet colored quinoneimine. The rate of formation is measured photometrically at 530 nm and is proportional to the Glucose concentration.

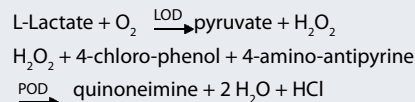


### Lactate

Lactate oxidase method for analysis of microdialysates

#### Measuring principle

Lactate is enzymatically oxidized by lactate oxidase. The hydrogen peroxide formed reacts with 4-chlorophenol and 4-amino-antipyrine. This reaction is catalyzed by peroxidase (POD) and yields the red-violet colored quinoneimine. The rate of formation is measured photometrically at 530 nm and is proportional to the Lactate concentration.

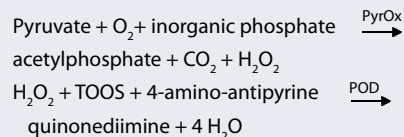


### Pyruvate

Pyruvate oxidase method for analysis of microdialysates

#### Measuring principle

Pyruvate is enzymatically oxidized by pyruvate oxidase (PyrOx). The hydrogen peroxide formed reacts with N-ethyl-N-(2-hydroxy-3-sulfo-3-propyl)-m-toluidine (TOOS) and 4-amino-antipyrine. This reaction is catalyzed by peroxidase (POD) and yields the red-violet colored quinonediimine. The rate of formation is measured photometrically at 530 nm and is proportional to the Pyruvate concentration.

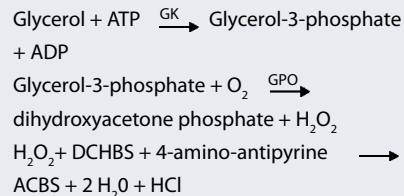


### Glycerol

Glycerol colorimetric method for analysis of microdialysates

#### Measuring principle

Glycerol is phosphorylated by adenosine triphosphate (ATP) and glycerol kinase (GK) to glycerol-3-phosphate, which is subsequently oxidized in the presence of glycerol-3-phosphate oxidase (GPO). The hydrogen peroxide formed reacts with 3,5-dichloro-2-hydroxy-benzene sulphonic acid (DCHBS) and 4-amino-antipyrine. This reaction is catalyzed by peroxidase (POD) and yields the red-violet colored quinoneimine. The rate of formation is measured photometrically at 530 nm and is proportional to the Glycerol concentration.



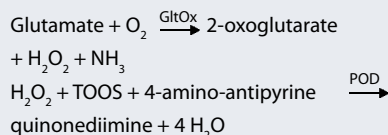
## Reagents

### Glutamate

Glutamate oxidase method for analysis of microdialysates

#### Measuring principle

Glutamate is enzymatically oxidized by glutamate oxidase (GltOx). The hydrogen peroxide formed reacts with N-ethyl-N-(2-hydroxy-3-sulfopropyl)-m-toluidine (TOOS) and 4-amino-antipyrine. This reaction is catalyzed by peroxidase (POD) and yields the red-violet colored quinonediimine. The rate of formation is measured photometrically at 530 nm and is proportional to the Glutamate concentration.

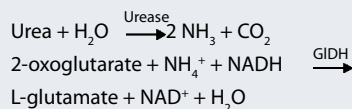


### Urea

Urea UV-method for analysis of microdialysates

#### Measuring principle

Urea is hydrolyzed in the presence of urease to ammonium ions and carbon dioxide. The ammonium ions react with 2-oxoglutarate in the presence of glutamate dehydrogenase (GIDH) and NADH to form glutamate and  $\text{NAD}^+$ . The rate of utilization of NADH is measured photometrically at 370 nm and is proportional to the Urea concentration.



### Calibrator A

For calibration of Glucose Reagent, Lactate Reagent, Pyruvate Reagent

Glycerol Reagent, Glutamate Reagent and Urea Reagent

#### Analyte Concentration

Glucose	5.55 mmol/L
Lactate	2.5 mmol/L
Pyruvate	250 $\mu\text{mol/L}$
Glycerol	475 $\mu\text{mol/L}$
Glutamate	25 $\mu\text{mol/L}$
Urea	13.3 mmol/L

The Microdialysis Analyzers use enzymatic reagents that are commonly used in clinical chemistry.

At present reagents for glucose, lactate, pyruvate, glycerol, glutamate and urea are available. The assays are based on kinetic measurements in order to get the analytical results as quickly as possible instead of waiting for the enzymatic reaction to reach completion, which might take several minutes. The absorbance change during the first 30 s of the reaction is monitored and the maximal reaction rate during this time is used for quantification.

A single multicomponent calibrator, containing known concentrations of the different analytes is used for calibrating the assays. Since the reaction rate is proportional to the analyte concentration, quantification is done by comparing the calculated slope of the obtained absorbance versus time curve with that obtained from measuring the calibrator solution with its known analyte concentrations.

For ordering information, see page 29.



# LABpilot™ and ICUpilot™ Software

data navigation in the laboratory

## ORDERING INFORMATION

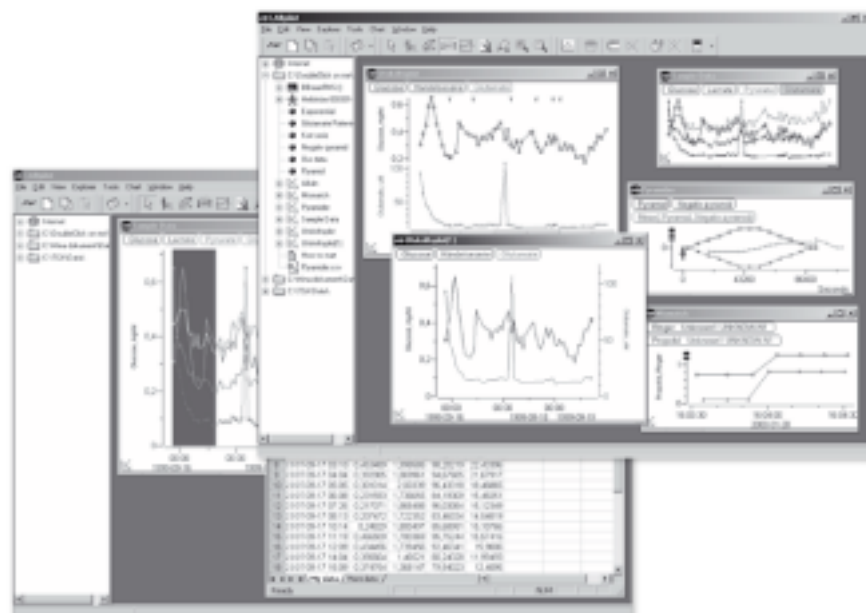
### LABpilot™ Software and ICUpilot™ Software

	Ref. No.
LABpilot™ Software	P000157
ICUpilot™ Software	B001027

These two computer programs are designed to handle microdialysis and other data collected over time. The programs' graphic interfaces allow integration and synchronization of microdialysis data from several subjects for faster data interpretation.

Simply copy MS Excel files and paste or drag directly onto the LABpilot™ or ICUpilot™ window to instantaneously generate graphs. Just one click can transform data from real time to elapsed time, from absolute values to percent values, view data as regression plots, display means, medians, SEM or SD.

The ICUpilot™ software enables connection with other patient monitors and automatic collection of multimodal monitoring data.



Designed to work using a graphical interface.  
The software facilitates processing a large number of data using graphs – not numbers.  
Display, compare, comment and interpret the data.

- \* Easy to handle graphic interface
- \* Display, compare, comment and interpret graphs
- \* Allows for faster data interpretation
- \* Allows for easy collaboration and communication



## Vial Adapter for MD Analyzers

THE ISCUS<sup>flex</sup> MICRODIALYSIS ANALYZER was originally developed to handle samples collected in Microvials (P000001). However, with the Vial Adapter for MD Analyzers, it is possible to use the ISCUS<sup>flex</sup> for analysis of samples collected in 300 µL glass vials.



### ORDERING INFORMATION

#### Vial Adapter for MD Analyzers

Ref. No.

P000114

Includes:

35 Vial Adapters

Used with glass vials from CMA Microdialysis AB.



#### ISCUS<sup>flex</sup> Normal Linear Range

REAGENT	LINEAR INTERVAL	SAMPLE VOLUME µL	REAGENT VOLUME µL
Glucose	0.1 - 25 mmol/L	0.5	14.5
Lactate	0.1 - 12 mmol/L	0.2	14.8
Pyruvate*	10 - 1500 µmol/L	0.5	14.5
Glycerol	10 - 1500 µmol/L	0.5	14.5
Glutamate	1 - 150 µmol/L	1.5	7.5
Urea	0.5 - 25 mmol/L	0.5	14.5

\* Pyruvate default linear range is low linear range

#### Methods for lower sample concentration

In basic research, samples are generally acquired at higher flow rates (1 - 5 µL/min) which results in lower analyte recoveries. In order to facilitate the analysis of these samples, the ISCUS<sup>flex</sup> Microdialysis Analyzer can be configured to use more sensitive methods for the following analytes:

#### ISCUS<sup>flex</sup> Low Linear Range

REAGENT	LINEAR INTERVAL	SAMPLE VOLUME µL	REAGENT VOLUME µL
Glucose	0.02 - 6.0 mmol/L	2.0	13.0
Lactate	0.02 - 2.5 mmol/L	0.8	14.2
Pyruvate*	2 - 900 µmol/L	2.0	13.0
Glycerol	2 - 500 µmol/L	2.0	13.0



# General Information

Customer Support



Internet Support



Office and Distributors



Customer Support

Support and Technical Service

For general information about the technique and for more information regarding our products you are welcome to contact us or the local distributor in your area.

We have a skilled staff available to solve your technical problems if an equipment oriented problem should arise.

Obtain a return authorization number from either your local Representative or Service before you return any products for repair.

A detailed description will help minimize cost and turnaround time.

Visit [www.mdialysis.com](http://www.mdialysis.com) for the latest technical support and service information.

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Fax: (978) 251 1960  
Email: [usa@mdialysis.com](mailto:usa@mdialysis.com)  
[service.usa@mdialysis.com](mailto:service.usa@mdialysis.com)



## Head Office (Sweden)

The head office of M Dialysis is located in Stockholm, Sweden not far from the Karolinska Institute. The branch office in Boston is responsible for the US, Canada and South America. Distributors in other countries can be found at [www.mdialysis.com](http://www.mdialysis.com)

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Delivery adress:  
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SE-120 30 Stockholm  
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Phone: (866) 868 9236  
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Distributor