

QUICK-GUIDE

VentrEX® Complete EVD-System



NEUROMEDEX - NEUROMEDEX - NEUROMEDEX - NEUROMEDEX - NEUROMEDEX

VENTREX® COMPLETE-EVD SYSTEM

Improved safety and functionality on all levels



Transparent components

Everything is made of transparent materials, allowing users to easily monitor the system at all times.



Cerebrospinal fluid repellent chamber filter

Repels not only water, but also cerebrospinal fluid: even after being in horizontal position for an extended period of time, for example during transport, clogging does not become an issue.



Finely graduated scale

Allows precise measurement of the cerebrospinal fluid's amount and quality – even when dealing with small drainage volumes



Large-lumen, color-coded components

The possibility of system occlusion by bloody cerebrospinal fluid is minimized – as well as the danger of confusion between venous or arterial components in the vicinity of the patient.



18

15

14

13

12

11

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5

4

3

2

1

0

-1

-2

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100

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80

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70

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60

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35

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10

5

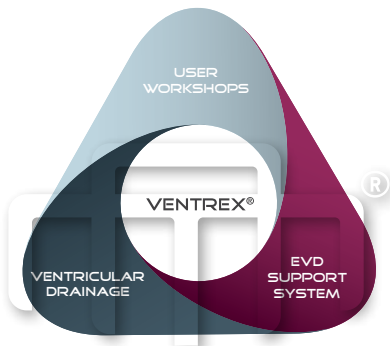
2

048

MINIMIZING RISK FACTORS – SYSTEMATICALLY

THREE PILLARS FOR A NEW STANDARD OF PATIENT SAFETY

When it comes to ventricular drainage, three main risk factors jeopardize the patient's safety: drainage-associated infection risks, blocked bacterial filters and user errors. With these in mind, NEUROMEDEX has developed the VentrEX ventricular drainage system. This all-round concept is based on three pillars:



Hygiene and ease-of-use optimized drainage system – preventing bacterial infection and operating errors

From the cerebrospinal fluid repellent chamber filter, making system occlusion a thing of the past, to the antimicrobial VentrGuard technology – the drainage system delivers holistic patient protection.

Intelligent stand – for precise and efficient drainage operation

Modular structure, adaptable to all hospital requirements, laser pointers for simple and accurate height adjustment and much more – the intelligent stand saves both time and effort while ensuring safe operation.

Regular training – to prevent user errors

The better the staff are trained, the fewer operating errors occur – and the safer is the patient's treatment. As a consequence, we offer regular and practice-oriented training courses to all NEUROMEDEX clients.

Preparation of the Drainage System

Installing & Adjusting the Support System



Daily Handling of the System

Intracranial Pressure Measurement

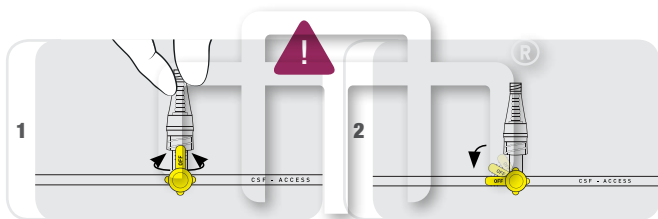
Description of the System & Sources of Error

Before Removal from Packaging

Assemble all sterile components necessary.



After Opening Packaging

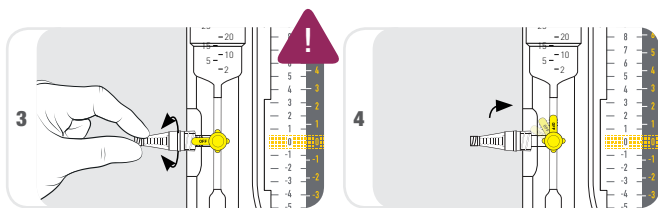


1

2

Check screwed components in patient line are tight

Close the system port 2 in the patient line



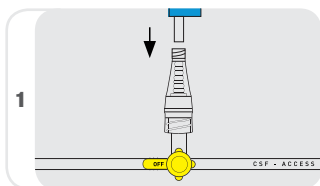
3

4

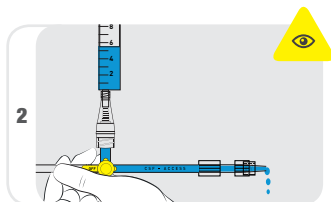
Check screwed components below measuring chamber 5 are tight

Close stopcock 6 below measuring chamber

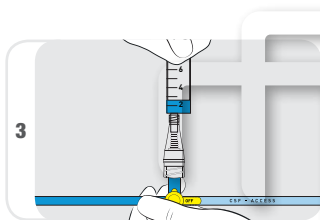
Before Start-Up - Filling the Patient Line



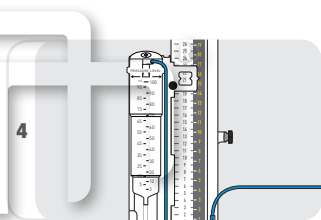
Fix Luer or Luer lock syringe onto the needleless valve



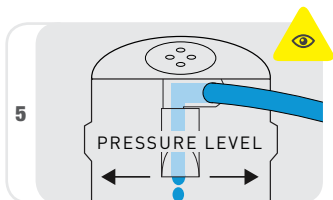
Fill patient line with sterile NaCl solution towards catheter connection 1



Fill patient line towards measuring chamber 5



Continue filling the patient line...

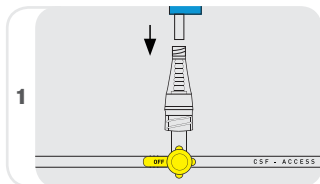


... until the solution drips into the chamber

OPTIONAL

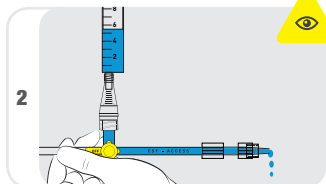
Prime the optional ICP-Transducer

If using a pressure transducer, prime it at this time*



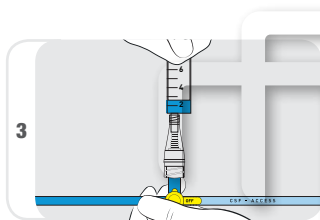
1

Fix Luer or Luer lock syringe onto the needleless valve



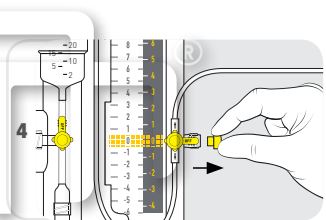
2

Fill patient line with sterile NaCl solution towards catheter connection **1**



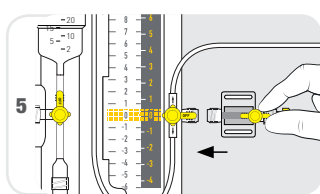
3

Fill patient line towards measuring chamber **5**



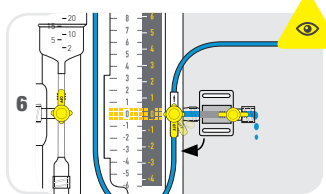
4

Remove cap from stopcock



5

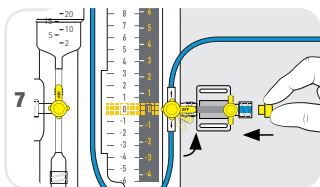
Attach transducer to stopcock



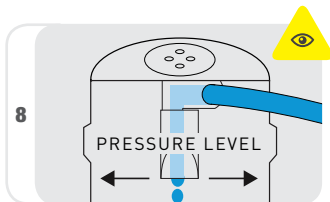
6

Prime transducer

NOTE: The filling pressure on the transducer must not exceed 300 mmHg!



7
Apply a sterile non vented cap
to transducer



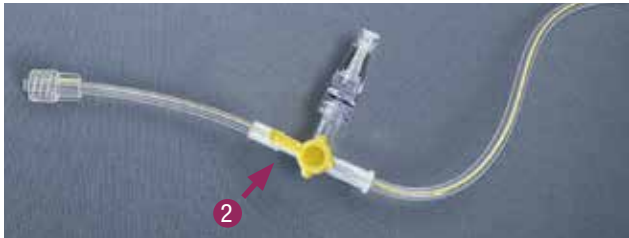
8
... and continue filling the patient
line until the solution drips into the
chamber

***NOTE:**

Neuromedex does not provide individual pressure transducers. Refer to product package for instructions, warnings, precautions and complications.

Connecting Drainage System to Ventricular Catheter

Put the system port ② in the “off” position towards catheter connection.



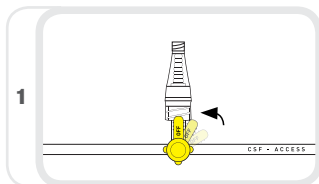
Once the catheter is in place, the prepared EVD system is connected to the catheter under strict sterile conditions. Disinfect with a swab before connection. Air pockets must be avoided.

**WORK
STERILE**

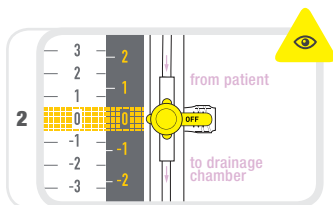




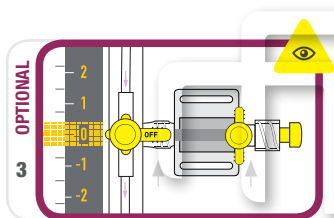
Step 3: Activating the Drainage System



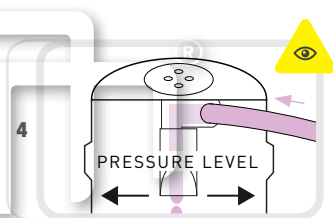
Put system port **2** into "OFF" position towards needleless valve



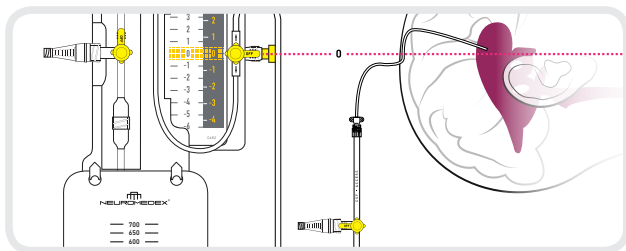
Check patient line
All stopcocks in the patient line must be open.



Check transducer
All stopcocks in the patient line must be open.



Check system

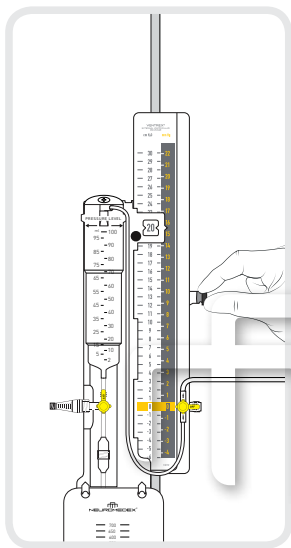


Check drainage height

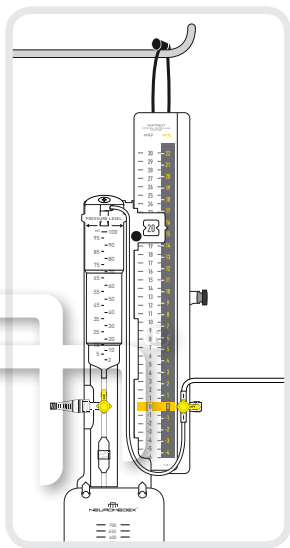
Installing & Adjusting the Support System



STEP 1: Mounting the support system to drip stand

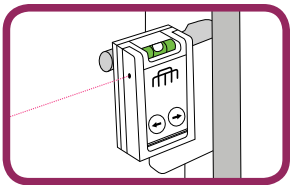


Attach system to IV-pole with clamp ...



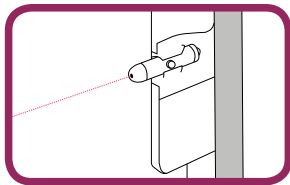
... or hang from pole using the attached cord

OPTIONAL



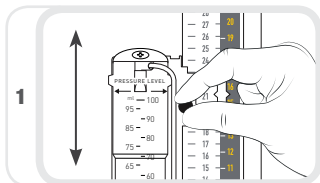
Optional laser pointer

OPTIONAL



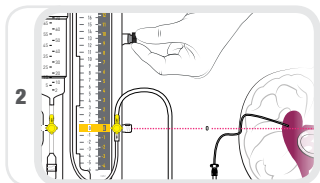
Optional laser pointer

STEP 2: Adjusting the Reference Point



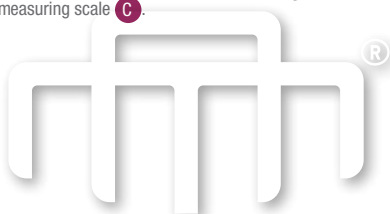
Adjust the intracranial pressure level

The marking "pressure level" 4 is adjusted to the desired intracranial pressure on the measuring scale C.



Adjust the reference point

With help of the laser pointer, the zero point of the measuring scale is adjusted to the height of the Foramen of Monro.





Daily Handling of the System



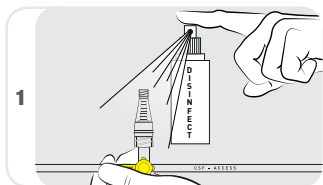
Use of the Needleless Port

The needleless port **2** is used for intrathecal drug injection, flushing of the system with isotonic saline solution (NaCl) and sampling of liquor.

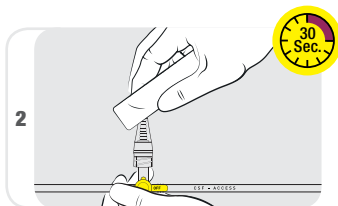
It is important to disinfect the port prior to use. The membrane of the port is cleaned with a swab according to hospital protocol.



The port **2** is constructed for use with **needleless** Luer or LL syringes.



Disinfect needleless valve before use



Please note contact time of 30 sec.

Handle membrane of valve according to hospital protocol.

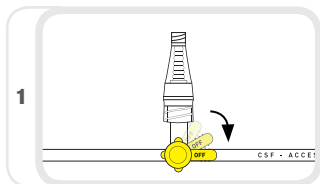


Do not use cannulas

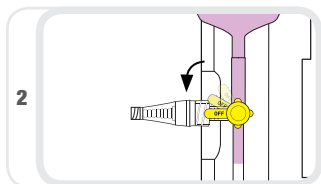


Only use Luer or Luer lock syringes

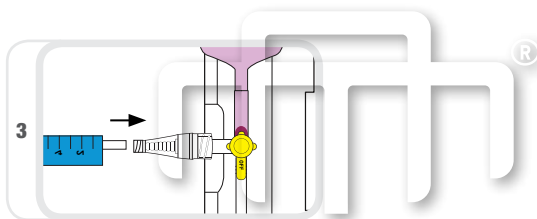
Emptying the Measuring Chamber



Put system port 2 in "OFF" position towards patient

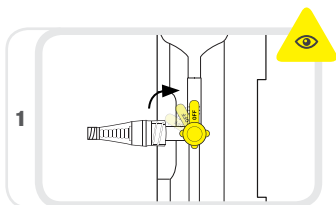


Empty measuring chamber by opening stopcock 6

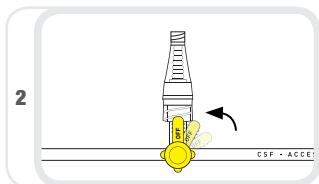


When drainage tube is blocked...
flush with NaCl solution via stopcock 6

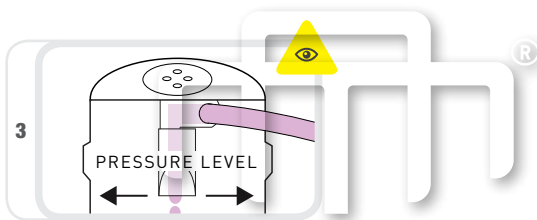
After Emptying the Measuring Chamber



Close stopcock **6**

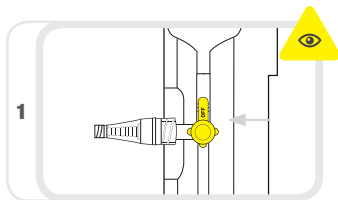


Put system port **2** into "OFF"
position towards needleless valve



Check system

Change of Drainage Bag



Check closed stopcock 6



Disconnect the drainage bag 8
and close clip ...



...Change drainage bag 8

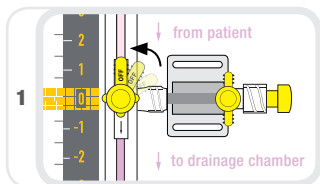


Intracranial Pressure Measurement

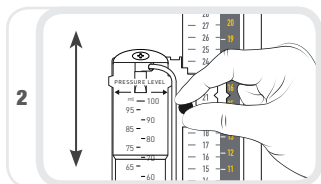
Pressure Measurement

OPTIONAL

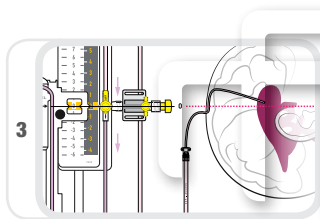
Zeroing the Transducer



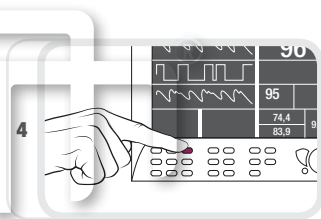
Put monitoring 3-way stopcock **3** in "OFF" position towards the patient
Fluid coming from the patient



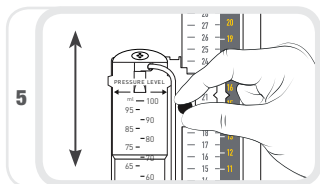
Adjust measuring chamber **5** ...



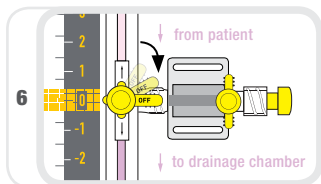
... on the support system to the zero point
or follow hospital protocol



Zero on monitor

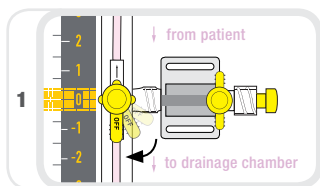


Adjust the intracranial pressure level
Position marking "pressure level" **4** to the desired intracranial pressure level on the measuring scale **C**

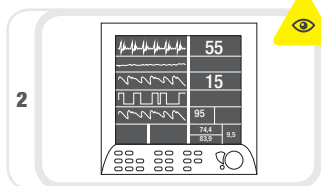


Open monitoring 3-way stopcock **3**

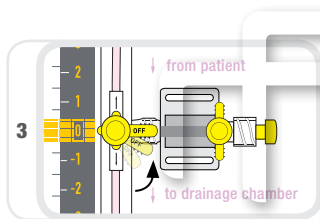
ICP Measurement



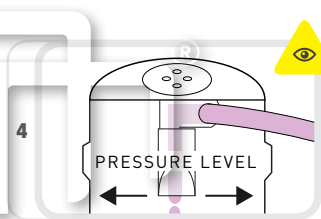
Close stopcock 3



Examine pressure data



Open stopcock 3 after ICP check



Check system

NOTE:

Precise ICP measurement is only possible during discontinued CSF drainage.





Problem	Possible Cause
Poor liquor drainage	Ventricular catheter kinked or blocked
	Patient line or check valve in measuring chamber blocked
Content of measuring chamber does not drain	Line below measuring chamber blocked
	Safety clip on drainage bag closed
	Drainage bag is swollen [®]
Missing amplitude in pressure reading	Transducer stopcock is open
	Monitor 3-way stopcock is closed
	Ventricular catheter or patient line is clogged
	Ventricular catheter or patient line is kinked
	Cable connection to monitor is disconnected
	Transducer defective
Low ICP amplitude	ICP measurement with simultaneous drainage
Pressure signal rises continuously	Monitor 3-way stopcock is closed towards measuring chamber
	Duckbill valve (optional configuration) is blocked
	Bacteria filter blocked

Measures

- Remove kinking
- Potential careful flushing of the catheter via system port with micro filter (0,2 µm)
(☞ "Use of the Needleless Port")
- Otherwise change catheter

1. Close system port towards patient
2. Flushing of the system with isotonic NaCl solution through the system port via the micro filter (0,2 µm) (☞ "Use of the Needleless Port")
3. Stopcock back to former position

1. Closing of patient line above system port
2. Flushing of patient line above stopcock with isotonic NaCl solution
(☞ "Emptying of Measuring Chamber")

- Change drainage bag (☞ "Changing of Drainage Bag")

- Change drainage bag (☞ "Changing of Drainage Bag")

- Close transducer stopcock

- Open monitor 3-way stopcock (see problem „Poor Liquor Drainage“)

- See problem „Poor Liquor Drainage“

- Remove kinking

- Check cable connection and maybe change signalling cable

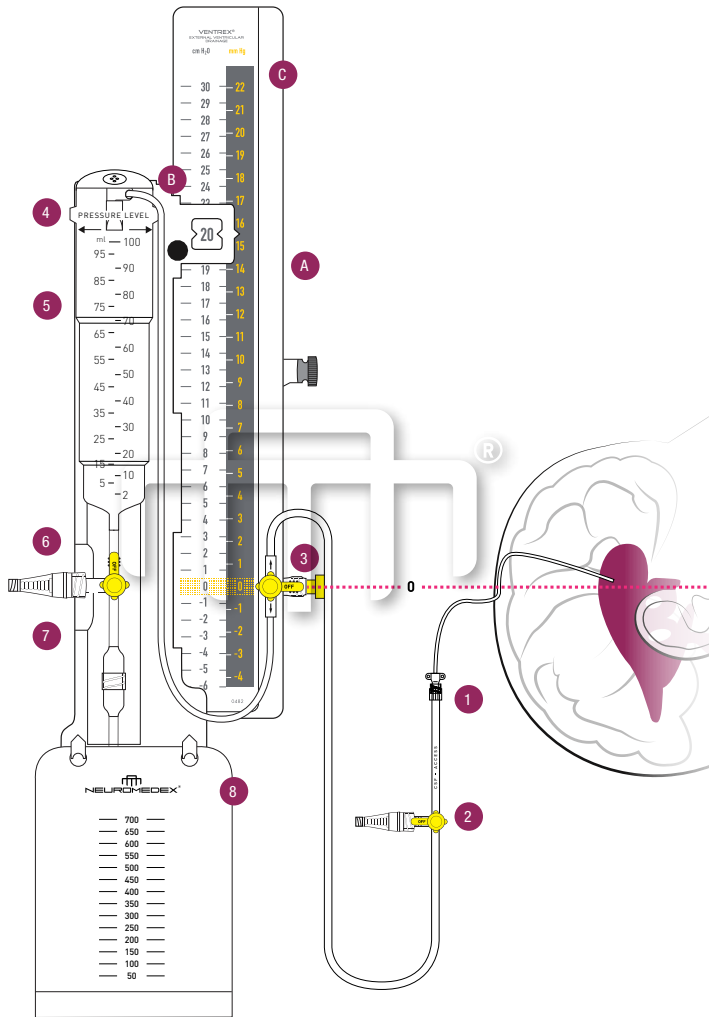
- Check functioning of transducer and maybe change transducer

- Close monitor 3-way stopcock towards measuring chamber

- Open monitor 3-way stopcock towards measuring chamber

1. Close system port towards patient
2. Flush system with isotonic NaCl solution through system port
(☞ "Use of the Needleless Port")
3. Turn back stopcock to initial position

A new EVD-system must be connected



System Specifications

- 1 Catheter Connector
 - 2 System Port
 - 3 Monitoring 3-Way Stopcock
 - 4 Pressure Level
 - 5 Measuring Chamber
 - 6 Stopcock for Emptying Chamber
 - 7 Outlet Tube to Drainage Bag
 - 8 Drainage Bag
-
- A Support System
 - B Measuring Chamber Holder
 - C Measuring Scale



Legend

- | | | | |
|---|----------------------------|---|-------------------------|
|  | Check |  | 30 seconds contact time |
|  | Visual Check |  | Do not use |
|  | Follow sterile precautions |  | Use |

This guide does not replace the instructions for use of the VentriEX[®] drainage system.



VENTREXCOMPLETE-EN-MAN-0716

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