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## INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI:10.21474/IJAR01/16633  
DOI URL: <http://dx.doi.org/10.21474/IJAR01/16633>



### RESEARCH ARTICLE

#### THE MOST COMMON TYPES OF HEMODIALYSIS MACHINE DAMAGE AND THE FACTORS THAT INFLUENCE THEM

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#### Manuscript Info

##### Manuscript History

Received: 10 February 2023  
Final Accepted: 14 March 2023  
Published: April 2023

##### Key words:-

Pressure, Pumping, Cleaning and Filtration

#### Abstract

Hemodialysis, or kidney replacement therapy, has been introduced in our country since 1975. Research ways to maintain the hemodialysis machine in good condition, minimizing damage to the apparatus. The study included a total of 52 medical devices from hospitals such as The First Central Hospital, Second State Central Hospital, and State Central Third Hospital named after P.N.ShastinandThe National Center for Maternal and Child Health of Mongolia. Chlorine test liquid, chlorine testing strip, Neo2 analyzer at The First State Central Hospital, chlorine testing liquid at the Second State Central Hospital, chlorine testing liquid at the State Central Third Hospital named after P.N.Shastin, analyzers and chlorine test strips in hospitals, chlorine testing liquid at the National Center for Maternal and Child Health, flow setting damage, filter clogging, pressure loss, filtration loss, and damage to a heparin pump are all common issues. Influencing factors include load, cleaning, operating conditions, and electricity fluctuations. The load and cleaning were the elements that influenced the hemodialysis equipment of the majority of previously named hospitals according to the study. Cleaning is responsible for the majority of the damage to the hemodialysis machine, accounting for 40 percent or more of it.

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#### Introduction:-

##### Rationale:

Hemodialysis, or kidney replacement therapy, was first introduced to Mongolia in 1975. Chronic and acute renal failure, which can be treated with hemodialysis, occurs when the kidneys lose their ability to filter toxins from the blood and eliminate them in the urine. The hemodialysis machine works on the principle of osmosis, and it removes toxins and purifies the blood through the use of a filter known as a dialyzer.

##### Purpose:-

Disinfection and sterilization of hemodialysis equipment, common failures solutions to prevent them.

##### Objective:-

1. Study the physical basis and operating principles of hemodialysis equipment.
2. Examine the most prevalent hemodialysis machine issues and damages, as well as the sterilization condition.

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3. Investigate ways to prevent hemodialysis equipment malfunction.

### Methods:-

Daily activities necessitate the use of tools for monitoring hemodialysis equipment and determining water composition. As a result, the hospitals stated above were polled about the monitoring tools. A total of 52 hemodialysis machines from four tertiary hospitals were included in the study.

### Results:-

Water coming from the drinking water supply is checked by placing a drop of chlorine test liquid. The chlorine indicator strips are dipped into purified water; The Neo2 analyzer determines the pH, pressure, temperature, and composition of the liquid. Chlorine test liquid, chlorine test strips, Neo2 analyzers are all available at the First State Central Hospital. The Second State Central Hospital has chlorine test liquid on hand. Third National Central Hospital lacks chlorine test strips, and according to the report, hospitals are short on analyzers, chlorine test strips, and chlorine test liquid, which is a disadvantage. According to the data collected from repairs of 35 hemodialysis machines at the First State Central Hospital, clogged filters or suction failure account for 30%, followed by pressure adjustment failure (25%), flow adjustment failure (25%), filtration adjustment failure (10%), and heparin pump failure accounts for 10% of all failures. Flow adjustment failure accounts 30%, clogged filters account for 30%, pressure loss accounts for 17%, filtration adjustment failure accounts for 17%, and heparin pump damage accounts for 10% at Second National Central Hospital. Filter obstruction 32%, flow adjustment failure 28%, loss of pressure 20%, and heparin pump damage account for 8% of the cases at Central Third Hospital named for P.N. Shastin. At The National Center for Maternal and Child Health filter obstruction accounts for 33%, flow adjustment failure accounts for 29%, filtration adjustment failure accounts for 8%, and heparin pump damage accounts for 8%. According to the survey, load and cleaning for First State Central Hospital and the Second State Central Hospital is the same respectively 40% and 35%, State Central Third Hospital named after P.N. Shastin load is 40% and cleaning is 30%, and the numbers are the are 38%, 30% for the National Center for Maternal and Child Health. The specified hospitals' electricity feed and working conditions fluctuate minimally, ranging from 10% to 20%. Load and cleaning are two aspects that affect the hemodialysis machine in most institutions. The majority of hemodialysis machine damage is caused by cleaning, which is responsible for 40% or more of the machine's faults. Equipment that has been cleaned properly is less likely to be damaged.

### Conclusion:-

The hemodialysis fluid must meet precise concentration, pressure, temperature, and pH requirements, and the blood purification procedure is carried out by drawing blood from the patient's arteries and infusing it into a vein. The study included 17 Fresenius devices, 24 Nipro Surdial-55 devices, 21 Doreson-NHB devices, 6 Nipro NCU-18 devices, 58 devices in total from The First Central Hospital, Second State Central Hospital, State Central Third Hospital named after P.N. Shastin and The National Center for Maternal and Child Health of Mongolia; Fresenius and Nipro NCU 18 machines perform hot cleaning, Nipro Surdial-55 and Doreson NHB perform cold cleaning, and the equipment is utilized for 14 to 17 hours every day. Common issues include flow adjustment failure, clogged filters, pressure adjustment failure, flow adjustment failure, and heparin pump damage. The load and cleaning of the hemodialysis machine are the two most important aspects in most hospitals. Because cleaning accounts for 40% or more of the damage to the hemodialysis machine, cleaning is responsible for the majority of the damage.

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