

Choosing a Dialysis Machine

Dr Gan Shien Wen, Sheryl
CONSULTANT
DIRECTOR FOR HAEMODIALYSIS PROGRAMME
DEPARTMENT OF RENAL MEDICINE
JULY 2019



Singapore
General Hospital



PATIENTS. AT THE HEART OF ALL WE DO.®



No conflicts of interest to declare

However...







“The ideal dialysis machine does not exist and will never exist, simply because the term ‘ideal’ is not well defined.”

“Even so, I am unable to define a single ‘ideal’ machine good for all purposes. Rather the definition must be adapted to the environment in which the dialysis machine is used.”

Hans-Dietrich Polaschegg

Contrib Nephrol. Basel, Karger 2002, 137, 227

“I choose the machine my Nurses choose.”

DIALYSIS IS COMPLICATED



Me

Make Friends

Introduce yourself

- a) How many different countries is your team from?
- b) How many different dialysis centres is your team from?
- c) How many people in your team have helped to purchase a dialysis machine before?

Choose a leader

Leader

- a) Appoint a scribe
- b) Choose a presenter for every question

Regulations

What regulations do you know govern the safety and standards required for a dialysis machine?

- International Organisation for Standardisation (ISO)
- Association for the Advancement of Medical Instruments (AAMI)
- USA – Food and Drug Administration (FDA)
 - Comprehensive self-test and fault indication capabilities
 - Safety standard for electrical medical equipment
- Ministry of Health (MOH) Singapore
- Refer to your local guidelines and policies

Team Based Approach

Who do you need in your team to help you choose a machine?

Team Based Approach

- Renal Physician
- Dialysis Nurses
- Biomedical Engineers
- Finance Team
- Patient
- Infection Control Team
- Health & Safety Team / Occupational Health Team



Existing Infrastructure

What about your existing centre do you need to be aware about when choosing a dialysis machine?

- How will this new machine play a role in your dialysis centre
- How many machines
- Proportion of machines versus the overall fleet
- Dialysis centre opening times and sessions required
- Type and range of disposables already in use

Treatment Required

What are the different types of dialysis are you aware of?
(apart from PD and wearable devices)

- Haemodialysis
- Haemodiafiltration
- Modulation of dialysate temperature
- Dialysate sodium modulation
- Ultrafiltration profiling
- Single needle
- Self assisted

Budget

How much money should your finance team budget to purchase for a haemodialysis machine?

Apart from the cost of the machine, what other cost should you consider when purchasing a machine?

Budget

- Cost of consumables
 - Dialysis circuit
 - Dialysis circuit tubing
 - Dialyser membrane
 - Dialysis needles
 - Syringes
 - Additional filters
 - Dialysate
 - Glucose
 - Calcium
 - Potassium
 - Citrate
 - Disinfection
 - Type
 - Frequency
 - Internal & External
- Cost of machine
- Cost of up-keep
 - Maintenance
 - Warranty and repair
 - Spare parts
 - Response time by vendor

Documentation

- Team members
- Record your needs and requirements of the hemodialysis machine
- Budget
- Assessment by every user if you trial the machine
- Overall assessment of all machines offered

Documentation

	SPECIFICATIONS: Haemodialysis Unit, Single Patient with Hemofiltration (hemodiafiltration (HDF) capability
1.1	A. Functional Requirements and Features
1.2	B. Technical Requirements
1.3	Dialysate Delivery
1.4	Blood Circuit
1.5	Disinfection
1.6	Display Parameters
1.7	System
1.8	Alarm
1.9	Wheels and Brake Mechanism
1.10	Accessories and Disposable Items
1.11	Warranty, Documentation and Support Services
1.12	In-service Training
1.13	Documentation
1.14	Repair and Replacement of Defective Equipment
1.15	Scheduled Inspection/Preventive Maintenance
1.16	Software/Hardware Updating
1.17	Stand-in Equipment

Evaluator

During the machine trial period, who should you choose for your evaluator?

- Nurses from various
 - Maturity
 - Designation
- The Nurse / Technician that collects the dialysate samples
- The Engineers / Technicians
- Health & Safety / Occupational Health
- Physicians

Documentation

RENAL DIALYSIS CENTER User Evaluation of Dialysis Machine

Date:	patient Name & IC		
Location:			
S/N	Item	Comments	Remarks
1	Brand	Fresenius	
2	Model	4008SNG (V10)	
3	Mobility of machine		
3.1	Machine is heavy to push around	Difficult to Easy ① ② ③	
3.2	Machine is bulky to push around	Difficult to Easy ① ② ③	
3.3	Wheel is big enough to push around	Small to big ① ② ③	
3.4	Wheel can be trapped in the lift gap	Yes/No	
3.5	Proper handle availability to hold when pushing machine	Yes/No	
3.6	Vision will not be blocked due to the height of machine	Yes/No	
4	Screen		
4.1	Step by step guide available on the screen	Yes/No	
4.2	Touch Screen	Yes/No	
4.3	Message on the screen is easy to understand and follow	Yes/No	
4.4	Time shown on the screen	Yes/No	
5	Machine Set up		
5.1	Time taken for self test		
5.2	Easy to set up for priming	Difficult to Easy ① ② ③	
5.3	Safety feature: alarm audio- level	soft to loud ① ② ③	
5.4	Safety feature: visual alarm	Hidden to prominent ① ② ③	
5.5	Power plug long enough	Yes/No	
5.5	Available place/hook to hang the cord when not in use	Yes/No	
5.6	Available place/hook to hang the water tubing when not in use	Yes/No	

Revised on 19/8/2016

RENAL DIALYSIS CENTER User Evaluation of Dialysis Machine

5.7	Tightness of connection between machine and water supply point	loose to tight ① ② ③	
5.8	Tightness of connection between machine and portable RO machine	loose to tight ① ② ③	
5.9	Tightness of connection between dialysate quicklock and dialyser	loose to tight ① ② ③	
5.10	Tightness of connection between machine and disinfection feedline	loose to tight ① ② ③	
5.11	Disconnection of tubing from water supply point	Difficult to Easy ① ② ③	
5.12	Disconnection of portable RO machine from dialysis machine	Difficult to Easy ① ② ③	
5.13	Disconnection of dialysate quicklock from dialyser	Difficult to Easy ① ② ③	
6	Disinfection		
6.1	Agent used for Disinfection		
6.2	Frequency of heat disinfection per manufacture recommendation		
6.3	Frequency of chemical disinfection per manufacture recommendation		
6.4	Time taken for heat disinfection		
6.5	Time taken for chemical disinfection		
	Others		
7	Frequency of changing ultra filter		
8	Duration of back up Battery		
9	Additional features: B/P CUFF, KT/V		
Other comments:			
			Name and Signature of Evaluator:

Revised on 19/8/2016

Additional Considerations

Share with the team what other things you feel are important when choosing a dialysis machine?

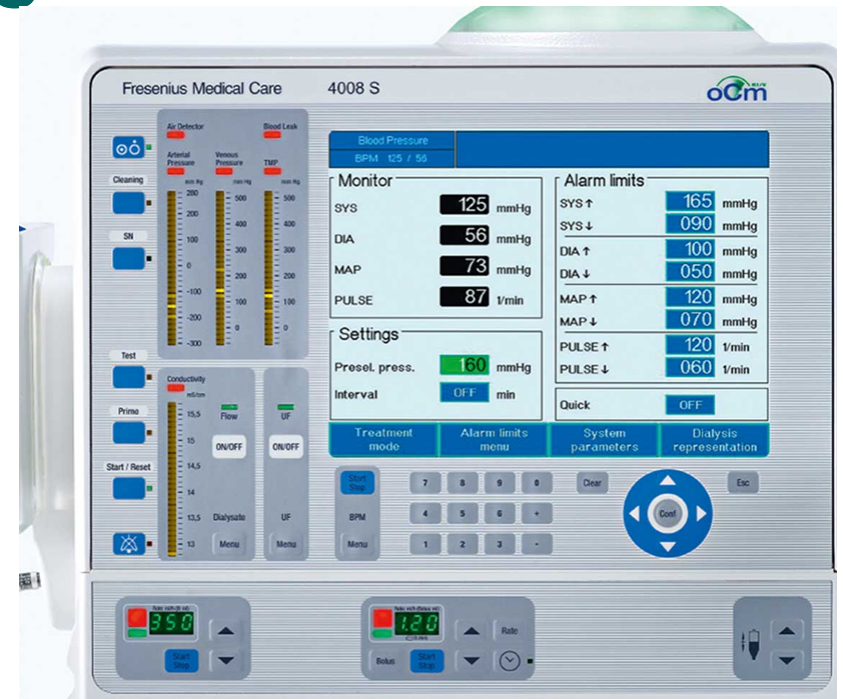
Additional Considerations

- In-centre versus out-centre dialysis
 - Size and weight
 - Mobility
 - Sturdiness



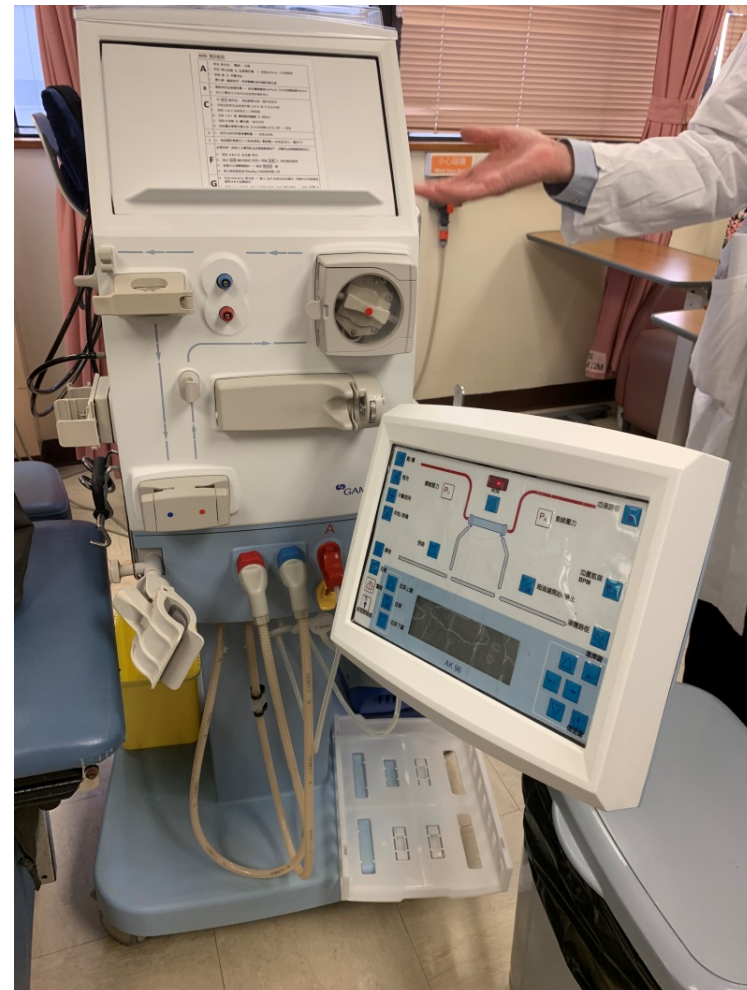
Additional Considerations

- Display monitor
 - Parameters
 - Keying and selecting
 - Disinfection



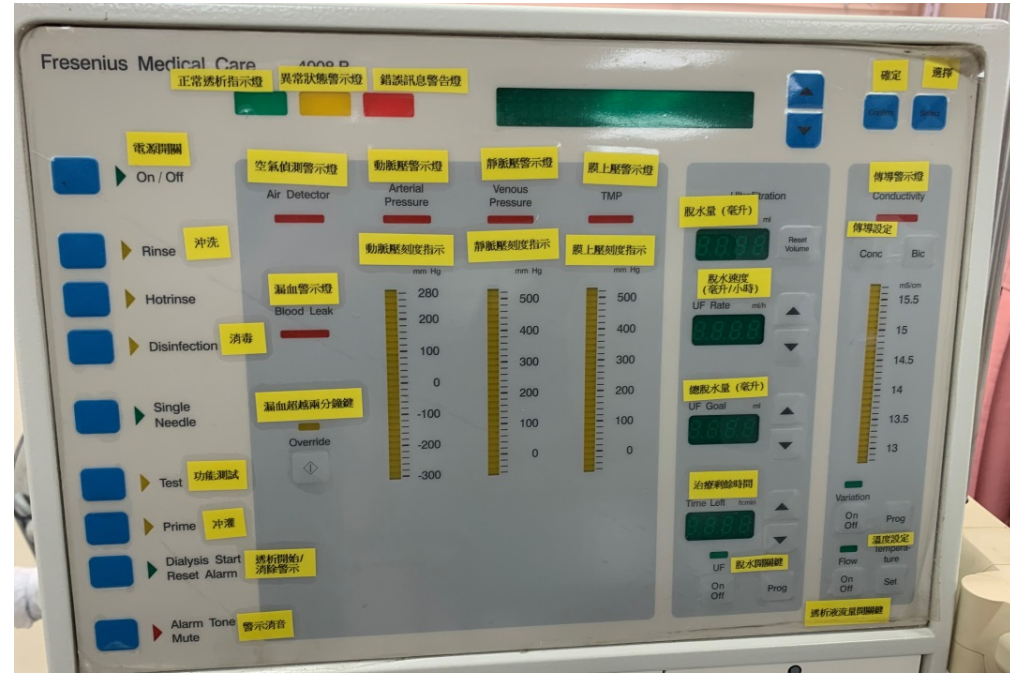
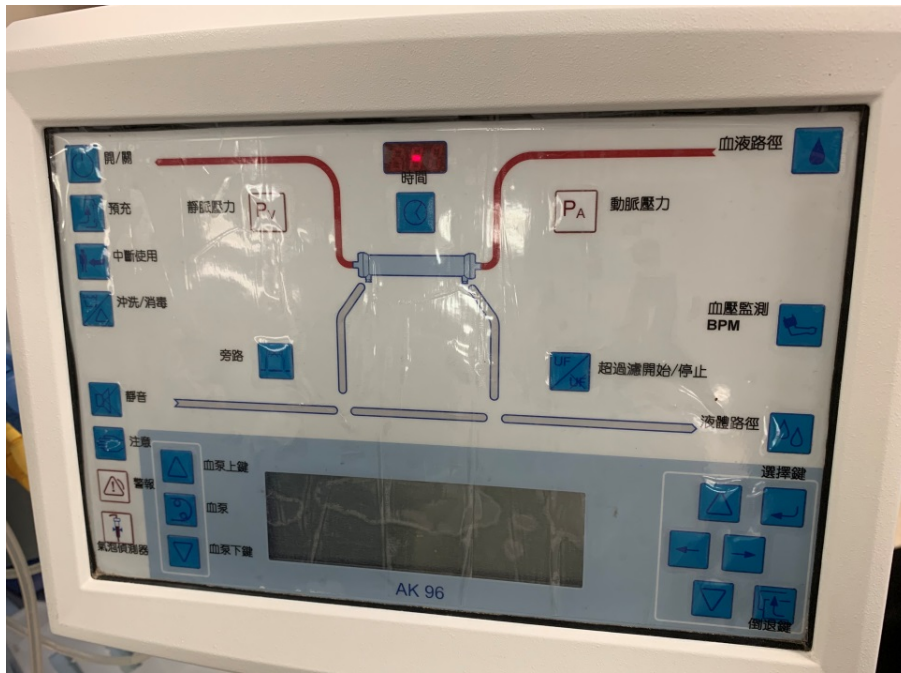
Additional Considerations

- Self assisted versus nurse lead dialysis



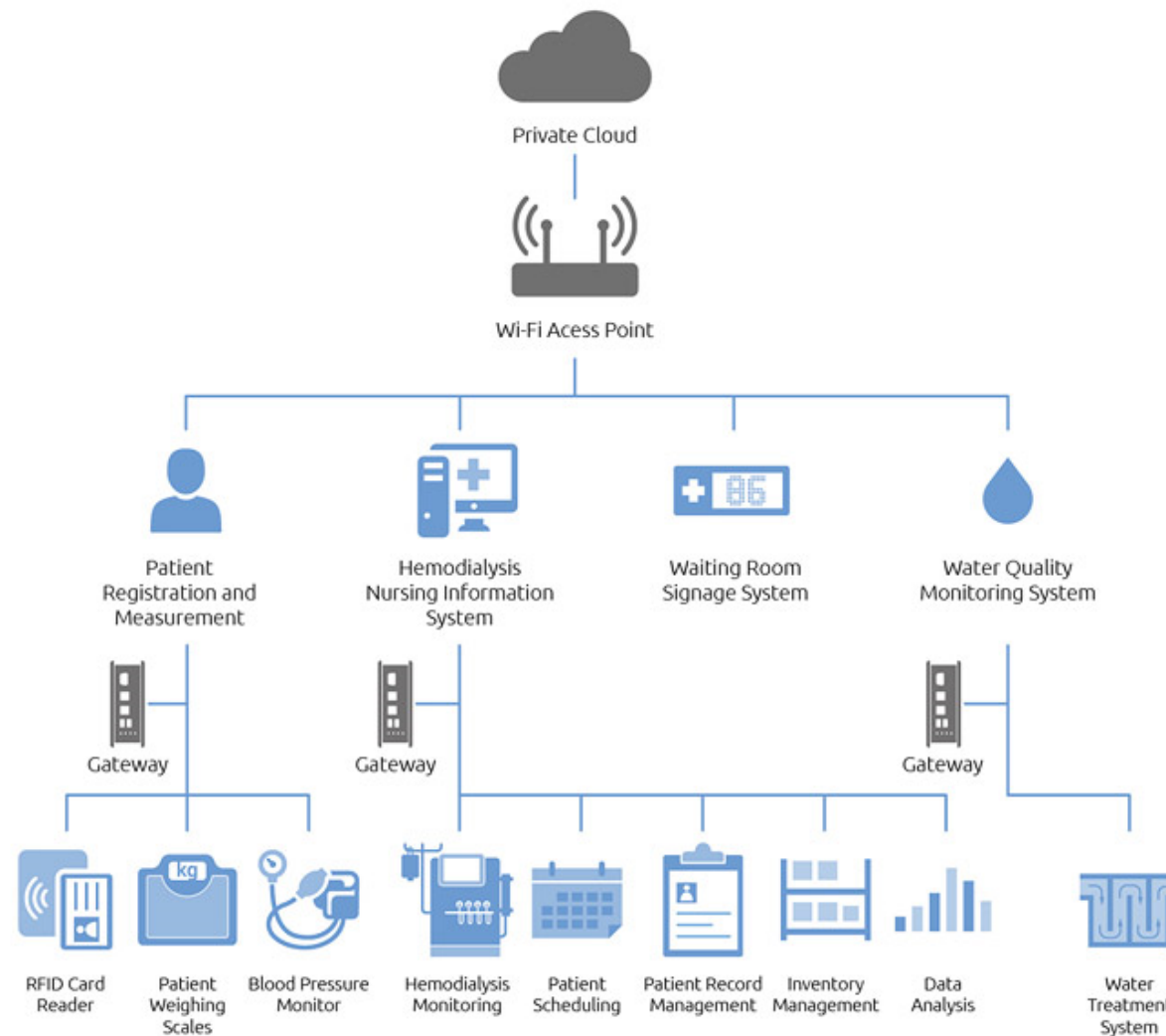
Additional Considerations

- Language



Additional Considerations

- Data recording and connectivity to IT software



Additional Considerations

- Alarms
 - Audio
 - Visual



Additional Considerations

- Turn around time required between sessions
 - Disinfection (internal and external)
 - Priming
- Monitoring capabilities
 - Online urea clearance
 - Blood volume change
 - Vascular access function
 - Blood pressure and heart rate
- Emergency
 - Power failure
 - Hypotension

Make Friends

- Ask the vendor if they would let you see or try out the machine
 - Training on the use of the machine
 - Provision of written information
 - Software updating
- Ask your colleagues in other centres on their experience

Thank You



Singapore
General Hospital