Missed Haemodialysis Sessions - Haemodialysis Treatment Guideline

1. Purpose

This guideline is to provide WA Country Health Service (WACHS) haemodialysis (HD) clinicians at WACHS Satellite Dialysis Units (SDUs) with information regarding management of HD treatments for end stage kidney disease (ESKD) patients who have missed HD session(s) and require HD treatment.

The WACHS Missed Haemodialysis Sessions – Medical Management Guideline provides WACHS medical officers (MOs) non-HD clinicians with information, regarding the medical management of ESKD patients who have missed HD session(s) and require stabilisation prior to commencing HD treatment.

2. Guideline

2.1 Implications of missed haemodialysis sessions

Regular planned HD treatment for ESKD patients is required for best clinical outcomes. The minimal usual standard for HD is three sessions per week of four to five hours in duration. Non-attendance to HD sessions is detrimental to the patient's health. Even one missed HD session per month is associated with an increased risk of hospitalisation, emergency department (ED) attendance and increased mortality.

Missed HD results in various clinical consequences including sodium and / or fluid retention (i.e. oedema), electrolyte disturbances, chronic hypertension and cardiac dysfunction resulting in chronic or acute pulmonary oedema (APO).

During a HD treatment, shifts in fluid volume, electrolytes and waste products occur which can lead to sudden changes in central nervous system (CNS) and cardiovascular stability. Patients are at highest risk for instability after missing a HD session, hence it is important appropriate pre-assessment, HD treatment parameters and patient monitoring occurs to avoid complications.

2.2 HD treatment pathways for patients who have missed HD sessions

Patients with ESKD will present with differing signs and symptoms when missing HD sessions. Thorough patient pre-HD clinician assessment is essential, with escalation to a medical officer (MO) when required. Adjustments to HD treatment parameters can be made to ensure safe HD treatment is provided and adverse effects such as cardiac complications, disequilibrium syndrome, seizures and death are avoided. Different management pathways should be followed based on the number of HD sessions missed.

Appendix A is a clinical decision-making flowchart for HD treatment for patients who have missed HD sessions.

Guidelines are designed to provide staff with evidence-based recommendations to support appropriate actions in specific settings and circumstances. As such, this guideline should

be followed in the first instance where practical. In the clinical context, where a patient's management should vary from this guideline, this variation and the clinical opinion as to reasons for variation should be documented in accordance with Clinical Practice Standards.

2.3 Patient follow-up for unplanned non-attendance

Each WACHS SDU should have a documented patient follow-up process to contact patients and / or their next of kin if patients do not attend a planned HD session or do not provide prior notification that they will not be attending their HD session.

The SDU Clinical Nurse Manager (CNM) / Shift Coordinator should contact the patient who did not attend a planned HD session to:

- discuss the reason for the patient's non-attendance to their HD session.
- determine the welfare of the patient and advise to attend their nearest ED if they are / become unwell.
- provide patient education / counselling on the clinical risks of missing scheduled HD sessions.
- discuss referral to multidisciplinary team (MDT) i.e., Aboriginal Liaison Officer and / or Social Worker as applicable, to provide assistance with improving attendance according to their individual need (e.g., transport provision).

Upon the patient's return to the SDU the SDU CNM / Shift Coordinator or HD clinicians should ensure that:

- The patient is made aware of the unit policy regarding missed HD sessions, including possible outcome of being transferred to a metropolitan dialysis unit.
- The patient is assessed for any medical or non-medical factors that impact on the capacity of the patient to attend scheduled HD sessions, and to provide a management plan to improve attendance.

If the patient misses two or more consecutive planned HD sessions the SDU CNM / Shift Coordinator should discuss a management plan with the patient's Nephrologist. The patient's Nephrologist should:

- review the patient's management plan which may include transfer of the patient to a metropolitan dialysis unit.
- communicate the revised management plan with the patient.

2.4 Treatment for missed HD sessions

Sessions missed	Description
One (1)	a patient who has had no HD treatment for three to four days
Two (2)	a patient who has had no HD treatment for five to six days.
Three (3) or more	a patient has had no HD treatment for seven or more days.

One or two missed HD sessions

Management and considerations include:

- If the patient is clinically stable, follow patient usual HD regimen.

- HD clinician to complete thorough patient pre-assessment to determine fluid status and calculate treatment ultrafiltration goal (UFG). Treatment ultrafiltration rate (UFR) should not exceed 1 L/hr.
- Thorough assessment is required to determine potential need for Isolated (ISO) Ultrafiltration (UF). Recommendations to be considered when performing ISO UF during a HD treatment include:
  - ISO UFR should not exceed 2 L/hr (e.g. 500 mL in 15 mins)
  - no ISO UF first and last 30 minutes of treatment
  - use HD machine with Blood Volume Monitoring (BVM) function (when able) for closer monitoring of fluid status.
- HD clinician to initiate patient follow-up for unplanned non-attendance, refer to Section 2.3.
- **If the patient is clinically unstable (e.g. increased oxygen requirement, complaints of chest pain etc.) request prompt MO review.**
  - Initiation of HD may be appropriate whilst awaiting MO review to commence stabilising the patient and avoid further deterioration. Initiation to be determined in consultation with SDU CNM / Shift Coordinator.
- The MO should refer to the WACHS Missed Haemodialysis Sessions – Medical Management Guideline which provides information regarding the medical management of ESKD patients who have missed HD sessions.
- Upon MO review and if a determination is made to initiate / continue HD treatment, the following assessments and recommendations for treatment can be implemented in consultation with the MO including:
  - check pre-HD electrolytes, urea and creatinine (EUC)
    - Blood gas analysis may be utilised to promptly assess potassium if available whilst awaiting formal EUC results.
    - Potassium baths can be adjusted as needed. Refer to Appendix B Haemodialysis Potassium Dialysate Concentration Sliding Scale.
    - If urea ≥40 mmol/L, then blood flow rate (BFR) can be decreased to 200-250 mL/min.
    - If urea ≥40 mmol/L consider reduced anticoagulation (e.g. low dose heparin 500 units bolus and 500 units hourly or enoxaparin 20 mg) or anticoagulation free HD if active bleeding present.
- Increase frequency of observations to 15-30 mins.

Three or more missed HD sessions

Management and considerations include:

- Patients that miss three or more HD sessions are at increased risk of instability and complications.
- Patients will likely present directly to the ED due to acute symptoms associated with missing three or more HD sessions.
- If the patient presents to the SDU do not commence HD until prompt medical review and Nephrologist / On-Call Renal Specialist consult by:
  - requesting prompt MO review to SDU; or
  - transferring patient for MO review and initial management in ED.
- The MO should refer to the WACHS Missed Haemodialysis Sessions – Medical Management Guideline which provides information, regarding the medical management of ESKD patients who have missed HD sessions.
- Patients potassium and respiratory status should be stabilised prior to commencing HD treatment in the HD unit. If **cardiac monitoring** or **Non-Invasive Ventilation (NIV**) is

commenced by medical staff and ongoing treatment is required whilst on HD, **care and monitoring needs to be performed by appropriately skilled ED or other competent staff** for the duration of HD treatment until transfer / discharge.

- Thorough clinical handover must be provided from ED to HD clinicians regarding management and treatment administered prior to commencing HD treatment.
- Considerations to schedule the HD treatment requirements of an acutely unwell patient may include:
  - adjustments to SDU nurse to patient ratios
  - extension of the usual operating hours of the SDU
  - additional support requirements from available MOs or other available senior nurses if out-of-hours HD is required to support the HD clinician performing the treatment.
- Approval to dialyse the patient is needed from the SDU CNM / Shift Coordinator and Site Director of Nursing / Coordinator of Nursing if HD treatments are required out of the usual operating hours of the SDU.

ATTENTION

Due to patient instability, acutely unwell missed HD patients may need to be nursed at a 1:1 or 1:2 ratio to ensure appropriate monitoring and patient safety.

SDU CNM / Shift Coordinator to consult with Site Director of Nursing / Coordinator of Nursing for approvals of increased resources as per regional processes.

2.5 Acute Patient HD Treatment Regimen

Due to potential patient instability, gentle HD treatment (i.e., a stepped approach to usual patient regimen) should be performed over three consecutive days to avoid severe complication and adverse effects from rapid shift and removal of waste products, electrolytes and fluid.

The MO, in consultation with the Nephrologist / On-Call Renal Specialist and HD clinicians, are to determine if the patient remains as an inpatient to complete their three consecutive treatments or if the patient is appropriate to attend as an outpatient. Refer to Table 1. Acute Patient HD treatment Regimen for treatment parameters and considerations.

Note: Any variations to the Acute Patient HD Treatment Regimen (Table 1) should be informed by a Nephrologist / On-Call Renal Specialist and documented clearly in the healthcare record.

Table 1: Acute Patient HD Treatment Regimen

	Day 1	Day 2	Day 3
Admission Status	Inpatient or outpatient	Inpatient or outpatient	Inpatient or outpatient
Treatment time	2 hours	3 hours	4 hours or usual prescribed regimen

	Day 1	Day 2	Day 3
Treatment modality	HD	HD	Usual prescribed regimen
Dialyser size	Fx60	Fx80	Usual prescribed regimen
Blood flow rate (BFR) mL/min	150 to 200 mL/min	200 to 250 mL/min	300 mL/min or usual prescribed regimen
Dialysate flow rate	Auto flow	Auto flow	Auto flow
Dialysate potassium concentration	As per potassium sliding scale table (Appendix B) Dependent on pre-HD potassium	As per potassium sliding scale table (Appendix B) Dependent on pre-HD potassium	Usual prescribed regimen
Anticoagulation	If urea ≥ 40 mmol/L consider reduced anticoagulation (e.g. low dose heparin 500 units bolus and 500 units hourly or enoxaparin 20 mg) If active bleeding anticoagulation free HD	If urea ≥ 40 mmol/L consider reduced anticoagulation (e.g. low dose heparin 500 units bolus and 500 units hourly or enoxaparin 20 mg) If active bleeding anticoagulation free HD	Usual prescribed regimen or reduced If active bleeding anticoagulation free HD
Fluid removal (UF) Treatment ultrafiltration goal (UFG) determined by thorough patient pre-assessment and fluid calculations Treatment ultrafiltration rate (UFR) should not exceed 1 L/hr	If ISO UF required, ISO UFR should not exceed 2 L/hr (e.g. 500 mL in 15 mins) No ISO UF first and last 30 mins If excessive fluid overload present, discuss with Nephrologist / On-Call Renal Specialist if treatment time should be extended to allow for extra ISO UF	If ISO UF required, ISO UFR should not exceed 2 L/hr (e.g. 500 mL in 15 mins) No ISO UF first and last 30 mins	If ISO UF required, ISO UFR should not exceed 2 L/hr (e.g. 500 mL in 15 mins) No ISO UF first and last 30 mins
Observation frequency	15 mins	30 mins	30 to 60 mins

	Day 1	Day 2	Day 3
Other considerations	Use HD machine with BVM function (if available) for closer monitoring of fluid status		

3. Roles and Responsibilities

WACHS staff are required to work within their identified scope of practice, level of experience and work role.

Site Director of Nursing / Coordinator of Nursing is responsible for:
- working in collaboration with the SDU CNM / Shift Coordinator to approve increased clinical support for acutely unwell patients who have missed HD sessions as required
- liaising with SDU CNM / Shift Coordinator to provide oversight and approval for an extension of the usual operating hours of the SDU for acutely unwell patients who have missed HD sessions
- working in collaboration with the SDU CNM / Shift Coordinator to ensure appropriate MDT planning and clinical review occurs to reduce the risk of unplanned attendance for HD sessions for high risk patients.

Nephrologist / On-Call Renal Specialist is responsible for:
- providing medical oversight and support to MOs and HD clinicians providing care to patients who have missed HD sessions
- approving emergency evacuation / transfer to tertiary hospital as required.

Patient's Nephrologist is responsible for:
- ensuring the patient is aware of clinical risks of missing scheduled HD sessions
- reviewing the patient's management plan which may include transfer of the patient to a metropolitan dialysis unit
- communicate the revised management plan with the patient.

Medical Officers are responsible for:
- providing medical care and oversight to patients who have missed HD sessions and present to WACHS facilities
- consulting with Nephrologist / On-call Renal Specialist to determine HD treatment plans or transfer to tertiary hospital
- consulting with SDU CNM / Shift Coordinator to discuss patient need for HD treatment and schedule HD sessions
- supporting HD clinicians in WACHS SDUs providing HD treatment to patients who have missed HD sessions.

SDU Clinical Nurse Manager / Shift Coordinator is responsible for:
- scheduling HD treatment for patients who have missed HD sessions in collaboration with MOs
- determining need for increased clinical support and change to nurse to patient ratios for acutely unwell patients who have missed HD sessions and escalate to Site Director of Nursing / Coordinator of Nursing for approval
- determining need for an extension of the usual operating hours of the SDU for acutely unwell patients who have missed HD sessions and escalate to Site Director of Nursing / Coordinator of Nursing for approval

- providing oversight and clinical support to HD clinicians providing treatments to patients who have missed HD sessions
- contacting patients after unplanned non-attendance
- ensuring patients are aware of clinical risks of missing scheduled HD sessions
- referring patient to MDT for appropriate support systems to facilitate HD session attendance
- discussing patient management plans with the patient's Nephrologist.

HD Clinicians are responsible for:

- providing clinical care and support to patients in the SDU who have missed HD sessions
- escalating concerns and deterioration in patients to MO and senior HD nursing staff (e.g., SDU CNM / Shift Coordinator) as required.

All staff are required to work within policies and guidelines to make sure that WACHS is a safe, equitable and positive place to be.

4. Monitoring and Evaluation

Monitoring of compliance to this guideline is to be undertaken bi-monthly by the WACHS Renal Services Team and WACHS Renal Governance Group through:

- review of outcome indicators of patient transfer data associated with missed dialysis
- review of patient safety and quality data including clinical incidents and consumer feedback related to missed haemodialysis.

This guideline is to be reviewed as required to determine effectiveness, relevance and currency. At a minimum it is to be reviewed every three years by the WACHS Renal Services Team and the WACHS Renal Governance Group.

5. References

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6. Definitions

Term	Definition
End Stage Kidney Disease	End Stage Kidney Disease (ESKD) is the stage of kidney disease when a person's kidney function cannot sustain their wellbeing, requiring some form of treatment to maintain life. Also known as end stage renal failure (ESRF).
Haemodialysis	Haemodialysis (HD) is treatment for ESKD via machine and artificial kidney using access to the bloodstream. Treatment can be nurse assisted or performed by patient self-caring.
Haemodialysis Clinician	A Haemodialysis Clinician is a qualified healthcare professional who provides direct patient care in

	haemodialysis e.g. Registered Nurse, Enrolled Nurse etc.
Haemodialysis Session	A Haemodialysis session is the four to five hour time period that conventional haemodialysis treatments are performed.
Nephrologist	A Nephrologist is a senior physician specialised in renal medicine providing diagnosis and management of kidney disease.
Non-Haemodialysis Clinician	A Non-Hamodialysis Clinician is a qualified healthcare professional who provides direct patient care e.g., registered nurse, enrolled nurse in a non-HD setting e.g., Emergency Department.
On-call Renal Specialist	An On-call Renal Specialist is a senior medical officer (registrar or advanced trainee) specialised in renal medicine providing out-of-hours medical oversight and governance of renal patients.
Medical Officer	A Medical Officer is a qualified healthcare professional who provides direct patient care, e.g. senior medical officer, resident medical officer, general practitioner (for district sites).
Satellite Dialysis Unit	A Satellite Dialysis Unit (SDU) provides haemodialysis away from a tertiary hospital site. This option is suitable for medically stable, relatively independent patients for whom home therapies is not appropriate.

7. Document Summary

Coverage	WACHS wide
Audience	Any WACHS haemodialysis clinician or medical officer providing direct patient care to ESKD patients presenting to WACHS health facilities after missing HD treatment.
Records Management	Clinical: Health Record Management Policy
Related Legislation	*Health Services Act 2016* (WA)
Related Mandatory Policies / Frameworks	Clinical Governance, Safety and Quality Policy Framework
Related WACHS Policy Documents	• Fiona Stanley Hospital (FSH) Haemodialysis Management Policy - Endorsed for Use in Clinical Practice (EUCP) Policy • Missed Haemodialysis Sessions – Medical Management Guideline
Other Related Documents	Nil
Related Forms	Nil
Related Training Packages	Nil
Aboriginal Health Impact Statement Declaration (ISD)	ISD Record ID: 3324
National Safety and Quality Health Service (NSQHS) Standards	1.07; 1.27; 2.06; 2.07; 3.05; 3.10; 3.11; 3.12; 3.14; 4.04; 4.15 6.09; 6.10; 6.11; 8.04; 8.06; 8.10
Aged Care Quality Standards	Nil
Chief Psychiatrist's Standards for Clinical Care	Nil

8. Document Control

Version	Published date	Current from	Summary of changes
1.00	24 October 2024	24 October 2024	• New guideline

9. Approval

Policy Owner	Executive Director Clinical Excellence
Co-approver	Executive Director Nursing and Midwifery Services
Contact	WACHS Clinical Nurse Consultant – Renal
Business Unit	Population Health
EDRMS #	ED-CO-24-299434

This document can be made available in alternative formats on request.

Appendix A: HD treatment pathways for patients who have missed HD sessions

Missed 1 to 2 sessions

Stable

Usual regimen

Unstable

Request prompt MO review*

Initiation of HD may be appropriate whilst awaiting review to avoid deterioration. Initiation to be determined in consultation with SDU CNM / Shift Coordinator.

Upon MO review, if a determination is made to initiate/continue HD treatment, the following assessments and recommendations for treatment can be implemented in consultation with the MO including:

- Check pre-HD Electrolytes, Urea and Creatinine (EUC)
  - Blood gas analysis may be utilised to promptly assess potassium if available whilst awaiting formal EUC results
  - Potassium bath can be adjusted as needed. Refer to Appendix B potassium sliding scale table
  - If urea ≥40 mmol/L, Blood Flow Rate (BFR) can be decreased to 200 to 250 mL/min
  - If urea ≥40 mmol/L consider reduced anticoagulation (e.g. low dose heparin 500 units bolus and 500 units hourly or enoxaparin 20 mg) or anticoagulation free HD if active bleeding present
- Increase frequency of observations to 15 to 30 mins

Care Considerations for all missed HD patients

- Thorough pre-HD assessment performed to determine fluid status and calculate treatment UFG. Treatment ultrafiltration rate (UFR) should not exceed 1 L/hr
- Determine potential need for ISO UF
- Use HD machine with BVM function (when able) for closer monitoring of fluid status
- If cardiac monitoring or NIV commenced at any time in the SDU or ED ongoing care and monitoring needs to be performed by appropriately skilled ED or competent staff for duration of HD treatment until transfer/ discharge
- Initiate patient follow-up for unplanned non-attendance (as per Section 2.3) including; discussion regarding reasons for non-attendance, determine patient welfare, provide education / counselling on clinical risks and referrals to MDT (ALO/SW) for support as applicable.

Missed 3 or more sessions

MO review & management in SDU or ED*

Nephrologist / On-Call Renal Specialist consult

Acute Patient HD Treatment Regimen

Day 1

- Inpatient or outpatient
- 2 hours HD
- Fx60, 150 to 200 mL/min BFR
- Potassium bath as per Appendix B potassium sliding scale table (dependent on pre-HD potassium)
- Anticoagulation - If urea ≥40 mmol/L consider reduced anticoagulation (e.g. low dose heparin 500 units bolus and 500 units hourly or enoxaparin 20 mg) or anticoagulation free if active bleeding
- If ISO UF required, ISO UFR should not exceed 2 L/hr (e.g. 500 mL in 15 mins)
- No ISO UF first and last 30 mins
- If excessive fluid overload, extended treatment time may be considered for extra ISO UF. Consult Nephrologist/On-Call Renal Specialist
- Observation frequency - every 15 mins

Day 2

- Inpatient or outpatient
- 3 hours HD
- Fx80, 200 to 250 mL/min BFR
- Potassium bath as per Appendix B potassium sliding scale table (dependent on pre-HD potassium)
- Anticoagulation - If urea ≥40 mmol/L consider reduced anticoagulation (e.g. low dose heparin 500 units bolus and 500 units hourly or enoxaparin 20 mg) or anticoagulation free if active bleeding
- If ISO UF required, ISO UFR should not exceed 2 L/hr (e.g. 500 mL in 15 mins)
- No ISO UF first and last 30 mins
- Observation frequency - every 30 mins

Day 3

- Inpatient or outpatient
- 4 hours or usual prescribed regimen
- Usual prescribed treatment modality
- Usual prescribed dialyser, 300 mL/min BFR
- Usual prescribed potassium bath
- Anticoagulation – usual prescribed regimen or reduced. Anticoagulation free if active bleeding
- If ISO UF required, ISO UFR should not exceed 2 L/hr (e.g. 500 mL in 15 mins)
- No ISO UF first and last 30 mins
- Observation frequency - every 30 to 60 mins

***NOTE: The MO should refer to the WACHS Missed Haemodialysis Sessions – Medical Management Guideline which provides information, regarding the medical management of ESKD patients who have missed haemodialysis sessions.**

Appendix B: Haemodialysis Potassium Dialysate Concentration Sliding Scale

Serum potassium	Dialysate potassium
≥ 4.5 mmol/L	2 mmol/L
< 4.5 mmol/L	3 mmol/L

Source: Fiona Stanley Fremantle Hospitals Group. Haemodialysis Management.