

STOP

HAEMODIALYSIS LINE DISCONNECTION GUIDANCE

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STOP Guidance

HAEMODIALYSIS LINE DISCONNECTION

BACKGROUND

Haemodialysis is a routine treatment for children and adults however it can come with some serious complications. Venous needle dislodgment (VND) is a life-threatening incident that if not recognised and acted upon immediately, can lead to considerable or even fatal blood loss. It only takes a few minutes for blood loss to prove fatal and therefore patients should be risk assessed on an individual basis and safety measures put in place to reduce the risk.

Patients with haemodialysis vascular access, whether that is a Central Venous Catheter (CVC), Arteriovenous Fistula (AVF) or Arteriovenous Graft (AVG) are at risk of arterial or venous line disconnection/dislodgement. Venous line disconnection/dislodgement is more likely to have severe consequences due to the blood pump continuing to pull blood from the patient. With arterial line disconnection/dislodgement, the blood continues to be returned to the patient until the air detector is activated which will then stop the blood pump. However, in both circumstances, you are also left with an access point that may be bleeding and requires urgent attention.

The acronym STOP stands for the principles as seen below to enable patients and healthcare professionals to maintain safety and reduce the risk of needle or catheter dislodgement.

S	afety	<ul style="list-style-type: none">• Risk Assessment• Risk Factors• Education
T	aping	<ul style="list-style-type: none">• Chevron/Butterfly Taping• H Technique Taping• Stabilising Devices
O	bservation	<ul style="list-style-type: none">• Visibility of patient• Visibility of Access• Observation of Access
P	ressure monitoring	<ul style="list-style-type: none">• Pressure limits• VND Technology

SAFETY

Individual risk assessment of the likelihood of venous needle dislodgement (VND) should be obtained on all patients dialysing via an AVF, AVG or CVC monthly or if there is a change in the patient's behaviour or management that would increase or decrease the risk (See appendix I, II, III).

Factors that increase the risk of venous needle dislodgement are:

Individual patient factors

- Age [very young or old]
- Patients who are prone to sweating [or have experienced or are more likely to experience hypotension or hypoglycaemia]
- Excessive hair
- Pruritus from the tapes/dressing
- Patients who are restless and confused or have communication difficulties
- Patients with at least one previous line dislodgement [potential for self-harm]
- Lone and/or nocturnal haemodialysis (1)

Access

- Poor or reduced visibility of the access
- Stenosis
- Non-tunnelled line
- Length of time the tunnelled CVC has been in place
- Stitches absent
- Dacron cuff visible [no longer under the skin]

It is imperative that patients, carers and healthcare professionals all receive adequate education on the risks associated with access dislodgement/disconnection and how to prevent a life-threatening event. Regular updates after the initial training will help maintain awareness and understanding.

The haemodialysis (HD) machine should always be on the side of the patient access to reduce the risk of taut lines increasing the risk of venous line/needle disconnection or dislodgement.

TAPING

Correct taping and securement of the AVF/AVG needles and patient lines is an invaluable step in preventing needle dislodgement.

Needles should be taped either using the chevron/butterfly method or H technique, to prevent needle dislodgement (Appendix I). The H technique may be easier for patients who cannulate themselves. The skin must be dry, and the tape must have adequate adhesive to be able to safely secure the needle to the skin.

If repositioning needles during treatment, the blood pump should be reduced or stopped, and new tapes used to secure the needle before treatment is restarted.

Blood lines should never be taped to objects such as the chair or bedside table.

AVF/AVG blood lines should be looped and taped to the arm (Appendix I).

Ideally, the haemodialysis machine should be on the same side as the patient's access.

When using a CVC, stabilising devices such as Griplock®, Statlock® or ParkLine® can be used to help secure the CVC.

The HEDclip can also be used to secure the looped dialysis lines to the patient's clothing.

OBSERVATION

Needle sites should always be visible so early recognition and prompt action are taken should there be a needle dislodgement. Patients should be asked not to cover their needle sites with blankets and clothing. Instead, it could be suggested they considered adaptive clothing that is available from various specialist clothing websites should they feel cold on dialysis.

This is slightly more challenging with CVCs due to the positioning on the line and the need to maintain dignity however, adaptive clothing is available. In paediatrics, it can be necessary to hide these connections to prevent younger children from tampering with their lines whilst mitigating the risk by having their carer present.

Needle/CVC sites and connections should be observed regularly for bleeding and this should be documented on an appropriate dialysis flow chart.

PRESSURE MONITORING

Needle or CVC dislodgement/disconnection can only be detected by the arterial or venous sensor if the pressure drop exceeds the difference between the actual pressure and the lower alarm limit.

Venous and arterial lower pressure limits should be set **30-40 mmHg below the actual venous pressure** (3). This should also help prevent numerous spurious alarms due to patient movement.

Despite these lower pressure limits being set, the drop in pressure with a dislodgement or disconnection may be too small to activate the lower alarm. Therefore, when a pressure alarm is activated, the vascular access should always be checked prior to resetting the alarm limits.

Haemodialysis and Hemodiafiltration machines may now have integrated technology that recognises a drop in venous pressure and stops the blood pump if a needle becomes dislodged.

In order to use these functions, it will require additional software and equipment. This technology works by placing an adhesive pad under the venous needle, if blood is to leak on the pad it will transmit a signal to the haemodialysis machine which stops the blood pump, clamps the venous line and creates a visual and audible alarm to warn the patient and healthcare professional.

There are multiple machines on the market for chronic haemodialysis and some may come with additional safety features that recognise a pressure drop before it reaches the lower pressure guard.

Although these features cannot be solely relied on for needle or CVC dislodgement/disconnection, dialysis units should familiarise themselves with any additional safety features an individual machine has available.

For machines that don't provide this technology, devices such as Redsense™, HEMODialert and HEMOSensor™ are independent alarms that detect blood leakage. A sensor is taped onto the needle site, if this detects fluid leakage, it will create an audible alarm. As the device is independent to the machine, it will not stop the blood pump, so a sense of urgency is required to assess the patient.

These devices can be used both for Central Venous Catheters (CVCs) and AVF needles. If the patient's risk of dislodgement is high, a device on both the arterial and venous needle may be considered.

PRINCIPLES OF SAFE ALARM HANDLING (MARC):

Mute: The alarm is there to draw your attention to the patient. Once with the patient, you can mute (Not reset!) the alarm to allow assessment of the patient and machine's condition.

Assess: Assess the condition of the patient, assess their blood access connections are secure and observe alarm indicators/messages on the machine. ****Take appropriate corrective action relevant to the alarm condition, in line with unit policy and machine manufacturer's recommendations.**

Reset: Following a full assessment of the patient and machine, and with corrective actions completed, reset can now be applied to allow the treatment to resume. Final checks must now be made to confirm that the alarm condition is resolved.

(Reset = 'Reset', 'Resume', 'Restart' depending on the machine)

Confirm: Before leaving the patient, confirm the patient's condition is stable, confirm their blood access connections are correctly tightened and secure and confirm all machine parameters are at safe levels to continue treatment.

****Machine-specific actions form part of Suppliers' training**

Assessment of the Risk of Arteriovenous Fistula/Graft Venous Needle Dislodgement during Haemodialysis

PATIENT NAME:

PATIENT NUMBER:

DOB:

Situation: Haemodialysis is a routine treatment for children and adults however it can come with some serious complications. Venous needle dislodgement (VND) is a life-threatening incident that if not recognised and acted upon immediately, can lead to considerable or even fatal blood loss. It only takes a few minutes for blood loss to prove fatal. Patients should be risk assessed on an individual basis and safety measures put in place to reduce the risk.

Background: Patients receiving HD via an AVF/AVG have one/two needles inserted, and taped to the skin to keep them secure and prevent dislodgement. Certain factors such as age, cognition, behaviour, HD side effects, needle sites not visible due to blankets or clothing and/or clammy/sweaty patients can increase the risk of VND. The risk may increase for patients who are isolated in side rooms or cubicles or are not visible to the HD team.

Assessment: The attached individual risk assessment of the likelihood of venous needle dislodgement (VND) should be carried out for all patients dialysing via an AVF/AVG monthly or if there is a change in the patient's behaviour or management that would increase or decrease the risk. Add up the scores for questions 1 to 6 to obtain the overall score.

Recommendation: Upon completion of the risk assessment, the patient will be labelled **LOW**, **MEDIUM**, OR **HIGH** risk with suggested recommendations.

Decision: Implement suggested recommendations or document alternatives that may be used to reduce the risk.

VND RISK ASSESSMENT SCORING

LOW - VND is unlikely to occur	MEDIUM - VND is likely to occur	HIGH - VND almost certain to occur
Score: 0-2	Score: 3-4	Score: > 5
<ul style="list-style-type: none"> • Double check AVF needle taping and connections • Continue with current taping and needle site checks • Educate the patient/parent /carer about VND • No further action required unless there is a change in the patient's status 	<ul style="list-style-type: none"> • Double check AVF needle taping and connections • Check needle sites and taping at regular intervals • Educate the patient/parent /carer about VND • If appropriate, use bed spaces that are visible to the dialysis team • Consider the use of a VND device if a carer/parent is unable to be present for the full treatment 	<ul style="list-style-type: none"> • Double check AVF needle taping and connections • Check needle sites and taping every 30 - 60 minutes • Educate the patient/parent/carer about VND • If appropriate, use bed spaces that are visible to the dialysis team. Avoid cubicles if possible • VND device is recommended if a parent/carer is unable to be present for the full dialysis OR the patient is in a side room / nursed in isolation

Assessment of the Risk of Central Venous Catheter Dislodgement /Venous Line Dislodgement during Haemodialysis

PATIENT NAME: _____

PATIENT NUMBER: _____

DOB: _____

Situation: Haemodialysis is a routine treatment for children and adults however it can come with some serious complications. Venous line or catheter dislodgment is a life-threatening incident that if not recognised and acted upon immediately, can lead to considerable or even fatal blood loss. It only takes a few minutes for blood loss to prove fatal. Patients should be risk assessed on an individual basis and safety measures put in place to reduce the risk.

Background: Patients dialysing via a tunnelled or non-tunnelled have stitches securing the line. For tunnelled central venous catheter (CVC) there is a Dacron cuff that is situated in the subcutaneous tunnel to aid engraftment. Certain factors such as age, cognition, behaviour, haemodialysis side effects, exposed Dacron cuff, and CVC not visible due to blankets or clothing can increase the risk of dislodgment. The risk may increase for patients who are isolated to cubicles or are not visible to the dialysis team.

Assessment: The attached individual risk assessment of the likelihood of venous line or catheter dislodgement should be carried out for all patients dialysing via a CVC monthly or if there is a change in the patient's behaviour or management that would increase or decrease the risk. Add up the scores for questions 1 to 5 to obtain the overall score.

Recommendation: Upon completion of the risk assessment, the patient will be labelled **LOW**, **MEDIUM**, OR **HIGH** risk with suggested recommendations.

Decision: Implement suggested recommendations or document alternatives that may be used to reduce the risk.

CVC RISK ASSESSMENT SCORING

LOW - VND is unlikely to occur	MEDIUM - VND is likely to occur	HIGH - VND almost certain to occur
Score: 0-2	Score: 3-4	Score: > 5
<ul style="list-style-type: none"> • Double check CVC connections • Continue with current CVC site checks • Educate the patient/parent /carer about venous line or catheter disconnection • No further action required unless there is a change in the patient's status 	<ul style="list-style-type: none"> • Double check CVC connections • Check CVC sites regular intervals • Consider a securing device • Educate the patient/parent /carer about venous line or catheter disconnection • If appropriate, use bed spaces that are visible to the dialysis team • Consider the use of a VND device if a carer/parent is unable to be present for the full dialysis treatment 	<ul style="list-style-type: none"> • Double check CVC connections • Check the CVC every 30 – 60 minutes • Securing device recommended • Educate the patient/parent /carer about venous line or catheter disconnection • If appropriate, use bed spaces that are visible to the dialysis team. Avoid cubicles if possible • VND device is recommended if a parent/carers is unable to be present for the full dialysis treatment OR the patient is in a side room/nursed in isolation

APPENDIX I

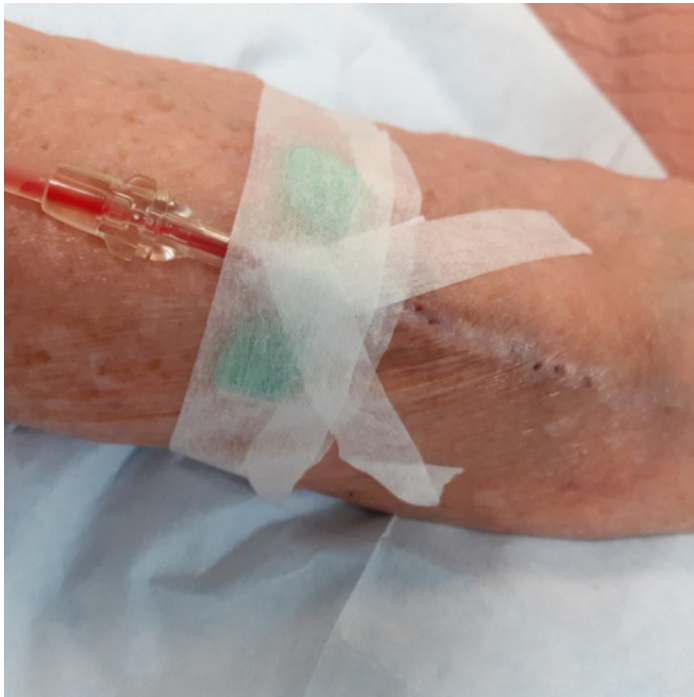
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APPENDIX II

1.1 Securing dialysis needles with tape

Chevron/Butterfly technique



H Technique



1.2 Securing dialysis lines



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