Quality of nursing practice in Arteriovenous Fistula care

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Introduction

• Chronic kidney disease (CKD) is an emerging public health problem and is rapidly transforming into an epidemic.

• Vascular access represents a high proportion of Morbidity, Hospitalization, Cost, and Mortality in patients.

• The creation and maintenance of functioning vascular access improves:
  • Quality of care in haemodialysis
  • Long-term survival
  • Quality of life of patients on hemodialysis via adequacy of dialysis
PLAN

- INTRODUCTION
- Vascular access modalities
- Chronic HD AV Fistulas
  - Characteristics of chronic HD AV Fistulas
  - Long term success of the AV Fistula
  - Fistula First Breakthrough Initiative (FFBI)
  - Multidisciplinary care

- AV Fistulas complications and Nursing management
  - AV Fistulas complications
  - Assessment of AV Fistula
  - Caring
  - Educating
  - Quality Assessment and performance Improvement Project to guide practice

- Conclusion
Vascular access modalities

AV fistula  AV Graft  Venous catheters

Tunnelled / Non-tunnelled

40%  1%  09 – 39%  12 – 20%

First dialysis
The native AVF remains the gold standard

<table>
<thead>
<tr>
<th>Safe</th>
<th>Reliable</th>
<th>Simple</th>
<th>Acceptable to patient</th>
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<tr>
<td>Well tolerated</td>
<td>Provides repeated access to circulation</td>
<td>Easy to place</td>
<td>Painless</td>
</tr>
<tr>
<td>Few complications</td>
<td>Provides continuous blood flow of 400 - 600 mL/min</td>
<td>Easy to use</td>
<td>Cosmetically acceptable</td>
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<td></td>
<td>Long lasting</td>
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Top reasons for long term success of the AV Fistula

- Good judgment for access-site selection
- Maintaining vessel integrity
- Comprehensive education and preparation for the time when dialysis should begin
- Creation the fistula at the right time for every patient
- Technical surgical excellence
- Appropriate management of complications
- Definition of strategy towards haemodialysis excellence
Planning for Vascular Access for Dialysis
Fistula First Breakthrough Initiative (FFBI)

Goal

- Ensure that all HD patients have the opportunity to be evaluated for a fistula first, and to receive an AV fistula where feasible, and not medically contraindicated

- Goal = 66% prevalence of functioning AVFs

- Additional goal to reduce catheter use and abuse

We’ve come a long way!

But the road ahead is even more challenging
Multidisciplinary care

- Referring physicians
- Surgeons
- Access coordinator
- Nephrology Nurse
- Nephrologist
- Radiologist
- Pharmacist
- Dietician

And?

Active participation of the patients / family’s lead to improve outcomes and a good quality of life.
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An ideal access delivers a flow rate adequate for the dialysis prescription, has a long use-life, low rate of complications.
AV Fistulas Nursing management
To optimize patient outcomes

Planning → Caring
Assessing

Core approach for safeguarding vascular access.

Educating
Evaluating
Assessment of AV Fistula: prior to every treatment

**Inspection: look for**
- Ecchymosis/discoloration breaks in the skin, erythema.
- Aneurysm
- Hematoma formations, curves/flat spots prior cannulation sites
- Hand or arm or limb swelling
- Discoloration of nail beds, Presence of accessory veins

**Palpation: feel**
- Thrill or pulsation
  - Normally a thrill is present and disappears after you manually occlude the AVF
  - If thrill remains = accessory
- Vein diameter, flat spots, aneurysms.
- Skin temperature:
  - Warm (infection?)
  - Cold (steal syndrome?)

**Auscultation: listen**
- Quality and amplitude of bruit:
  - Sounds should be continuous

**Baseline documentation**
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Is the New AVF Mature? KDOQI “RULE of 6’s”

- **6 cm of straight segment**
- **6 - 8 week Post Op Check AVF Maturation**
- **Access Blood Flow Greater than 600 mL/Min**
- **Diameter Greater than 6 mm**
- **Depth below skin Approximately 6 mm**

“Rule of 6’s”
Cannulation of a new AV fistula

- Prepare skin before cannulation (antibacterial soap/antiseptic)

- Recognize the pain, (whether psychological or physical), that accompanies cannulation

- Obtain “road map” of the AV fistula (graft)

- Use the “wet” needles

- Insert one needle (use for arterial supply)
Three broad techniques

- **Area puncture**
  - Cannulation in a restricted area
- **Buttonhole**
  - "Constant-site"
  - Use of dull edged or blunt needles.
  - For use only with an AV fistula, not an AV graft.
- **Rope ladder**
  - Cannulating the entire length of the fistula in a different site

**Traditional technique**

**BIOHOLE plugs**
Technique for Cannulation

Three-Point Technique

Provides for accuracy

Facilitates easier cannulation

Apply tourniquet to upper arm

One Needle-Two Hole Illustration

Has little pain associated with it

Avoids trauma to intima of vessels
Check for arterial circulation of the hand: Steal Syndrome

**Allen Test**

**Compress** both the radial and ulnar arteries

Patient open and close the hand

**Evaluate** Capillary refill to the hand

- **Less than 3 seconds**
  - **Negative test** adequate blood flow in the palmer arch

- **More than 3 seconds**
  - **Alert**: plan for access placement / revision

blood supply to the hand

Hypoxia
pain (mild – severe)
etc...

Risk factors:
- AV Grafts
- Upper arm fistulas
Fistulogram?

1. If fistula flow < 500 mL/min or drop of > 20% of previous value.
2. If graft flow < 650 mL/min or drop of > 20% of previous value.
3. If dialysis inefficacy.

Check the arterial dialysis pressure (ADP) at every dialysis.
Access Flow Recirculation

Extracorporeal Blood Flow $Q_B$, ml/min

AV Flow, ml/min

To dialyzer

From dialyzer

Artery

Vein

Recirculation, %

$RECIRC = \frac{P-A}{P-V} \times 100$

AV Fistula

Courtesy of B. Canaud
Decrease risk of dislodged needles

- Secure blood lines to patient’s clothing, **DO NOT TAPE TO CHAIR**

- Place machine on same side as vascular access

- If you need to adjust a needle, use fresh tape

- Patient teaching-keep access visible, do not use lotion on access arm on dialysis days
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  - Educating
    - Self-management support: The 5 A’s
    - Access-related patient education programs
    - Information brochure for patients: Patient safety:
    - Educate staff
  - Quality Assessment and performance Improvement Project to guide practice

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Educate patients

• Planning therapeutic patient education sessions/activities
Promote patient self management

Self-management support

The 5 A’s cycle

© WHO 2004

Assess: Beliefs, Behaviors & Knowledge

- Assess: Beliefs, Behaviors & Knowledge
- Advise: Provide specific information about health risks and benefits of change
- Agree: Collaboratively set goals based on patient’s interest and confidence in their ability to change the behavior(s)
- Assist: Identify personal barriers, strategies, problem-solving techniques, and social environmental support
- Arrange: Specify plan for follow-up (e.g., visits, phone calls, mailed reminders)

1- List specific goals in behavioral terms
2- List barriers and strategies to address barriers
3- Specify follow-up plan
4- Share plan with patient, team, and patient’s support network

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Self management would include such things as:

- Patient cleans access
- Self cannulation
- Examination of access (look, listen, feel)
- Understanding of numbers (clinical lab values)
- Understanding of monitoring and interventional tools that are available
Educate patients: Producing an AV fistula brochures for patients

To avoid needle dislodgements

**PATIENT SAFETY IS OUR NUMBER ONE GOAL**

**PLEASE KEEP YOUR ACCESS UNCOVERED**

SO WE CAN SEE IT AT ALL TIMES!

**WHY? FOR YOUR SAFETY!**

**TO BE SURE THAT:**

- Needles are secure
- Bloodline connections are visible
- No blood is lost

**SAFETY CHECKLIST:**

- Access is visible
- Bloodline connections are visible
- Lines are free from tugging
- Tape is secure

**Help Us Ensure Your Safety!**

AV fistula and patient safety

**Keep it in Plain Sight**

*ALWAYS THINK PATIENT SAFETY*

Venus Needle Dislodgement:

one of the most areas of patient safety concern.

To help address and prevent this problem, the following provides a checklist of actions to ensure patient safety.
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  • Purpose
  • Protocol oversight: “Controlled Language”
  • Evaluation of professional practice
  • Educate of staff

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Quality Assessment and Performance Improvement Project to guide practice:

Purpose I

- Develop and monitor Practice guidelines
- Provide for a systematic method to continuously assess and improve all aspects of health care delivery
- Improve patient care outcomes through the ongoing objective assessment of important aspects of patient care based on quality, cost, and service and the appropriate solutions of identified problems
Quality Assessment and Performance Improvement Project to guide practice: Purpose II

- Monitor the medical necessity, appropriateness of AV fistulas care, and adverse outcomes
- Collect and analyze Outcome data on an ongoing basis
- Ensure patient safety
Protocol oversight: Controlled Language

- Ensure policies reflect current standards of care & best practice

Develop a “Controlled Language” (CL) adapted to health professional needs

Example: Supervise the following elements every [15] minutes during [1] hour:
- [blood pressure],
- [machine parameters]
Evaluation of professional practice (EPP)

- The EPP is an organized approach to improve practices to continuously benchmark the practices performed and the results obtained with professional recommendations.

- Methods: decision trees, Monitoring of clinical practice patterns, Peer Review, review of death–morbidity, clinical pathway, root cause analysis, Auditing,.....
EPP of vascular access in hemodialysis
Integrated Clinical Pathway

↑Fistula, ↓catheter rate

Implementation of action Plan
Quality improvement plan
- Action plan
- Re-audit to check effectiveness

Prepare the action plan
- Team: multidisciplinary
- Problem area
- Communicate

Develop & Do the action
- Protocol: Clinical Technical Expert Panels/ DOQI
- Methodology
  Inclusion, Exclusion criteria, Tool, indicators
- Data Collection

Verify & Analyse the results
- Gap analysis
- Discussion of the results

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### Measurement Guidelines: key measures

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<th>Indicator Rate:</th>
<th>Calculation</th>
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<tr>
<td><strong>Outcome</strong></td>
<td>Annual thrombosis rate for AVF/PTFE</td>
<td># thrombosis episodes in AVF / PTFE within the study year divided by the total number of AVF/PTFEs at risk/year.</td>
</tr>
<tr>
<td><strong>Process</strong></td>
<td>Annual rate of radiological procedures</td>
<td># of radiological procedures performed within one year per each functioning VA for a whole year.</td>
</tr>
<tr>
<td><strong>Outcome</strong></td>
<td>VA survival</td>
<td>time period from the first use until end of follow-up after necessary surgical and/or radiological repairs had been to maintain VA permeability.</td>
</tr>
<tr>
<td><strong>Process / Outcome</strong></td>
<td>- Maturation - Failure - Additional required interventions - Past and current incident - Prevalent AVF - Hospitalization - Infection</td>
<td>Numerator = event/problem related with AVF / PTFE Denominator = total number of AVF / PTFE / population at risk X 100, 1000</td>
</tr>
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</table>
And .... Staff education

Educate, educate and educate staff..
Conclusion I

• Vascular access remains the single most important and modifiable risk factor for death and illness in the haemodialysis population

• Preserving vascular access patency strongly influences treatment outcomes for patients

• Patient starts dialysis with a functioning AV fistula have best outcome
Conclusion II

- Vascular access failure is a veritable public health problem

- Quality of life and overall outcome could be improved significantly:
  - Increased placement of native AVFs
  - Detection of dysfunctional access before thrombosis of the access route occurs.

- Integrate the quality improvement approach in training of professional
References I

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  - http://www.who.int/
  - http://www.has-sante.fr
References II


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