Implementing a Vessel Health & Preservation Programme

Roy Ventura
IV Access Specialist Nurse, Aintree University Hospital
Aim of the session:

- Discuss the benefits of a Vessel Health and Preservation (VHP) Programme
- Describe the implementation plan of VHP Programme
- Identify the methods for providing input and evaluation of the program
"The patients just seem a lot calmer since we got these new IV bags."
Vessel Health & Preservation (VHP)

Process that applies evidence-based guidelines for:

- Vascular access device selection, insertion, maintenance, and removal
- Implements best practice guidelines
**Vessel Health & Preservation**

1989 - Marcia Ryder introduced the concept of a vascular access device algorithm

1990s - decision to expand into programmes

2008 - multidisciplinary summit in the USA

- Clinical pathway
- Right line for the Right patient at the Right time™
- Implemented within 24 hours of admission into any acute facility

2012 - UK VHP Team
Why is it important?

- Pathway = consistency of care (Phillips, 2011)
- Intentional selection = preserves veins for future needs of patient
- Education + compliance with guidelines = reduced complications
- ↓vascular access devices : ↑ greater patient satisfaction
Key concepts

The 7 Rs of vascular access

✓ The ‘RIGHT’ line
✓ The ‘RIGHT’ patient
✓ The ‘RIGHT’ time
✓ The ‘RIGHT’ clinician
✓ The ‘RIGHT’ vessel
✓ The ‘RIGHT’ tool/s
✓ The ‘Right’ HCW
The ‘RIGHT’ line

- One device for the duration of therapy
- The best vascular access device based on treatment plan type of therapy, duration, etc.
- pH and Osmolarity of infusate is very important
- Most appropriate device with the lowest risk
The ‘RIGHT’ patient

- Based on patients’ long term needs
- Vessel health
- Preference
- History paralysis
- Coagulation abnormalities (INR: 50,000, APTT 35 – 45 sec)
- Others: confusion, dementia, IVDU
- Any allergy to lidocaine, chlorhexidine, latex, etc.
The ‘RIGHT’ time

• Early assessment (<24 hrs) and placement (<48 hrs)

• Early placement of appropriate device reduces patient complication

• Daily assessment and removal when treatment complete
The ‘RIGHT’ clinician

• Appropriate training, supervision and procedural load

  It is not about the grade!

• Clinicians who inserted >50 catheters will have half the complication rate of a clinician less <50 (Taylor and Palagiri, 2007)

• Complication rate is inversely proportional to the longevity of the device
The ‘RIGHT’ vein

• Vein assessment prior to insertion

✓ Vessel diameter – without tourniquet!
✓ Tortuosity
✓ Stenosis
✓ Bifurcation

• 1 French gauge (Fr) of Diameter Size = 0.33 millimeters (mm) in length
The ‘RIGHT’ assessment tool

- Evidence-based
- Peer-reviewed
- Tested
- Practical
- User friendly
Implementing a VHP Programme
Implementing a VHP Programme

Evaluate Vascular Access Processes to Identify Gaps and Need for Vessel Health and Preservation
Evaluate Vascular Access Processes to Identify Gaps and Need for Vessel Health and Preservation

- Review of policies/protocols/service
- Review of vascular access device usage and complications
- Thematic review of IV-related infections
- Point prevalence audit (PPA)
## Thematic review of IV related infections

<table>
<thead>
<tr>
<th>Sample date</th>
<th>Wd</th>
<th>Comments</th>
<th>Provenance of infection</th>
<th>Good practice</th>
<th>Learning Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>30/8/15</td>
<td>Patient admitted with heart failure. The patient required IV furosemide, PICC inserted, however patient pulled it out.</td>
<td>Possibly the peripheral cannula</td>
<td>The patient was referred for a PICC</td>
<td>Numerous cannulations pre PICC insertion.</td>
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<tr>
<td>25</td>
<td>20/03/16</td>
<td>This lady was had uncontrolled diabetes and had multiple venflons (approx. 15) and had poor access. Lady was treated with antibiotics for unknown sepsis 3 times; all were thought to be catheter related. She now has a long term catheter insitu.</td>
<td>Possible peripheral line</td>
<td></td>
<td>There was no referral to the IV Access team despite 30 days cannulation.</td>
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<table>
<thead>
<tr>
<th>Source of infection</th>
<th>Number of cases</th>
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<tbody>
<tr>
<td>Unknown</td>
<td>4</td>
</tr>
<tr>
<td>Peripheral line associated</td>
<td>6 (likely)</td>
</tr>
<tr>
<td>Skin and soft tissue</td>
<td>8 (possibly)</td>
</tr>
<tr>
<td>Central Line associated</td>
<td>1 (possibly)</td>
</tr>
<tr>
<td>Septic Arthritis</td>
<td>1</td>
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<tr>
<td>Prosthetic joint infection</td>
<td>1</td>
</tr>
<tr>
<td>Chest</td>
<td>3</td>
</tr>
<tr>
<td>Surgical wound</td>
<td>1</td>
</tr>
<tr>
<td>Chronic wound</td>
<td>1</td>
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<tr>
<td>Epidural Line</td>
<td>1</td>
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## Point prevalence audit

<table>
<thead>
<tr>
<th>Date:</th>
<th>Ward:</th>
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<tr>
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<table>
<thead>
<tr>
<th>Bed #</th>
<th>Hospital Number</th>
<th>Date of admission</th>
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<tr>
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</table>

<table>
<thead>
<tr>
<th>Bed days:</th>
<th>Cannula sited / Location</th>
<th>≤ 72 hours insitu?</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of cannulas last 7 days</th>
<th>Vessel health (vein quality)</th>
</tr>
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<tbody>
<tr>
<td></td>
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</table>

<table>
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<tr>
<th>Prescribed IV medications</th>
<th>Duration of IV medications prescribed for?</th>
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<td></td>
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<table>
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<tr>
<th>Midline / PICC required?</th>
<th>Notes:</th>
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<table>
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<tr>
<th>Audited by:</th>
<th></th>
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</table>
# Vessel Assessment

<table>
<thead>
<tr>
<th>Grade</th>
<th>Vein quality</th>
<th>Definition if vein quality</th>
<th>Insertion management</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Excellent</td>
<td>4-5 palpable/visible veins suitable to cannulate.</td>
<td>Cannula may be inserted by trained/authorised health care practitioner</td>
</tr>
<tr>
<td>2</td>
<td>Good</td>
<td>2-3 palpable/visible veins suitable to cannulate.</td>
<td>Cannula may be inserted by trained/authorised health care practitioner</td>
</tr>
<tr>
<td>3</td>
<td>Fair</td>
<td>1-2 palpable/visible veins suitable to cannulate. (Veins maybe small, scarred or difficult to find and require heat packs to aid vasodilation)</td>
<td>May require Infrared Viewer or Ultrasound</td>
</tr>
<tr>
<td>4</td>
<td>Poor</td>
<td>Veins not palpated/visible (requires ultra sound assistance or Infrared Viewer)</td>
<td>Cannula to be inserted by an expert in Cannulation. Use Infrared Viewer, Ultrasound, transillumination or other aids</td>
</tr>
<tr>
<td>5</td>
<td>None identifiable</td>
<td>No visible (naked eye or aids) or palpable veins.</td>
<td>Not for peripheral cannulation</td>
</tr>
</tbody>
</table>
Point prevalence audit

Vessel Health

- Excellent: 36%
- Good: 24%
- Fair: 37%
- Poor: 2%
- Non identifiable: 1%

N = 119
Point prevalence audit

• One patient had 9 cannulas in 11 days

• One PVC on day 9 (ACF, continuous IV diuretic infusion)

• Another on day 6 (foot, Vancomycin)

• 3 cannulas found in feet

• Thumb X 1

• Breast X 1
Point prevalence audit

**Midline / PICC required**

- **No**: 67, 56%
- **Yes**: 52, 44%

N = 119
Moving forward:

• Continue education and training

• Engagement from staff

• Expansion of the IV team to ensure - Right Device for the Right Patient at the Right Time™

• UK VHP Framework trial
UK VESSEL HEALTH AND PRESERVATION

INTRODUCTION

The clinical guidelines on the management of peripheral vascular disease (PVD) have been developed to help healthcare professionals in the planning, delivery and evaluation of care for patients with PVD. These guidelines aim to ensure consistent, high-quality and effective care across the UK. The guidelines are intended for use in a wide range of healthcare settings, including hospitals, primary care, community settings and other healthcare environments.

Hallam et al., 2016

GLOSSARY OF TERMS

- Peripheral vascular disease: A condition that affects the blood vessels outside the heart, brain and spinal cord.
- Vascular access: The placement of a catheter or other device into a blood vessel to provide access for treatment.
- IV therapy: Intravenous therapy, which involves the administration of medication directly into the bloodstream.

REFERENCES

- Additional references and citations provided within the guidelines.

RIGHT LINE DECISION TOOL

- IS IV THERAPY REQUIRED?
- HAVE ALTERNATIVE ROUTES BEEN CONSIDERED AND EXCLUDED?

VEssel ASSESSMENT

- PERIPHERAL VESSEL ASSESSMENT
- ARTERIAL VESSEL ASSESSMENT
- VEINS VESSEL ASSESSMENT

SUITABILITY OF DRUGS

- EXAMPLE OF A DRUGS LIST

(Hallam et al., 2016)
Implementing a VHP Programme

Evaluate Vascular Access Processes to Identify Gaps and Need for Vessel Health and Preservation

Select Unit and Present VHP Program
Select Unit and Present VHP Programme

- Presentation of UK VHP Framework to the Trust IV Steering Group

- Deciding what the project is:
  Research material vs Service Review vs Service Evaluation vs Service Improvement

- Engage relevant groups
  Ethics Committee, Clinical Assurance Group, Clinical Leads

- Registered with Research and Development Department as a Service Evaluation

- Registered with Edge Hill University Ethics Department
Justify the Project

- What is the Trust currently doing to assist in the decision-making process of appropriate VAD selection?

- IV access algorithm; however this does not take into consideration vessel health or reassessment

- Was it working?

- No evidence to suggest that it works, anecdotal evidence suggests delays in referral time to IV team

- Did it meet the needs of the patients or service?

- Delays in referral and increased infection rates suggest it didn’t
Effectiveness and Efficiency of the Framework:

• Effectiveness - can we produce positive results?

• Will the UK VHP impact on IV access complication rates?

• Will the UK VHP impact on referral times to IV team?

• Will the UK VHP impact on the difference in line selection?

✓ Measurable outcomes

✓ Pre-evaluation data recorded and accessible
What is it to measure?

- Usage figures for VADs
- Number of requests
- Waiting time
- Number/rate of complications i.e. infection
- Who is requesting?
- Is the VHP framework used?
- Reason for not using framework
Implementing a VHP Programme

1. Evaluate Vascular Access Processes to Identify Gaps and Need for Vessel Health and Preservation
2. Select Unit and Present VHP Program
3. Educate Staff on Vessel Health and Preservation
Educate Staff on VHP

- Identify target audience
- Engage the staff
- Allocate training dates
- Training materials i.e. power point presentation, posters, handouts, venue, \textit{Sigma (electronic request system)}, spreadsheet
IV Link
Nurses
IV Access Device Pre-Assessment Questions

Please make sure all questions are answered and the UK Vessel Health Preservation Tool has been used, so a suitable assessment of request can be made by the IV Access Team.

Reason for IV Access *

View Text

Medication and Length of Therapy *

View Text

Vascular access with administration of intravenous drugs and fluids is common practice in healthcare. Vessel Health and Preservation is an intentional process using evidence-based guidelines for selecting a vascular access device (VAD) that minimizes damage to vessels while preserving them for future use. Before placing this order please ensure you have used the VHP tool, which is available to see from the Blue I at the start of the order.

Was the "UK Vessel Health Preservation Framework Tool" used to decide appropriate IV access for patient?

View Text

Designation of Requestor *

View Text

Please confirm Hickman Line & Portacath requests have been agreed by Consultant in charge of care

Order Items

IV Access PICC Line Insertion

Discipline: Services

Required: 04-Mar-2016 12:41

2121212121

Container: No Container

Priority: 1 Hour CT Head

Warning Type: Authorisation

Rule Name: IV Access PICC Line Insertion

Messages:

Routine & Fluoroscopic Guided IV Access PICC insertions are now managed by IV Team.

To see the UK Vessel Health Preservation Framework Tool click on the Blue I

Please contact IV Access Nurse on Ex 0521/8406/6781/07815699606 or bleep 5484 for any concerns regarding this request.
Educate Staff on VHP

- Two training days:
  Delivered 4 x 30mins sessions on what the project entailed and how to use the UK VHP framework

- Pre-evaluation questionnaire to establish perceived knowledge, skills and confidence in doing associated tasks

- To undertake a post evaluation questionnaire to see if there is a significant difference
Implementing a VHP Programme

- Evaluate Vascular Access Processes to Identify Gaps and Need for Vessel Health and Preservation
- Select Unit and Present VHP Program
- Educate Staff on Vessel Health and Preservation
- Implement the Tools and Process in One Unit
Implement the Tool and Process

- 3-month evaluation from July to October 2015 – Haematology
- 6-month evaluation from April to September 2016 - Cardiology
- Support from Evaluation Team bi-weekly
- E-mail support, etc.
Implementing a VHP Programme

1. Evaluate Vascular Access Processes to Identify Gaps and Need for Vessel Health and Preservation
2. Select Unit and Present VHP Program
3. Educate Inserters and Unit Staff on Vessel Health and Preservation
4. Implement the Tools and Process in One Unit
5. Promote Better Communication Between HCW
Promote Better Communication Between HCW

- Follow-up
- Feed-back
- Engage staff
- Cascade best practice
- Embed change in practice
Implementing a VHP Programme

Evaluate Vascular Access Processes to Identify Gaps and Need for Vessel Health and Preservation

Evaluate for Compliance and Improvement

Select Unit and Present VHP Program

Promote Better Communication Between HCW

Educate Inserters and Unit Staff on Vessel Health and Preservation

Implement the Tools and Process in One Unit
## Evaluation data

<table>
<thead>
<tr>
<th>Pre-evaluation</th>
<th>Post-evaluation</th>
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</thead>
<tbody>
<tr>
<td>• 55% of staff did not know that the Trust had an IV access algorithm</td>
<td>• 60% of staff were aware of the UK VHP Framework</td>
</tr>
<tr>
<td>• 95% of staff did not know what drugs, dependent on pH and osmolality, could be delivered via specific VAD</td>
<td>• 50% of staff now had an awareness that pH and osmolality of drugs was significant when delivering via specific VAD</td>
</tr>
<tr>
<td>• 80% of staff did not know how to access the information in relation to pH and osmolality</td>
<td>• 50% also understand, that if in doubt where they could access the information</td>
</tr>
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</table>
Number of PICCs/Mids Inserted

Number of PICCs/Mids Inserted

Jan-May 2015

Jan-May 2016

Jan-Feb 2016

Mar-Apr 2016

17

58

24

32
Waiting Time

Currently: 0.82
During Audit: 1.24
Audit Results: 2.75

5 day working
7 day working

Currently: 3.62
During Audit: 5.5
<table>
<thead>
<tr>
<th>SPECIALITY</th>
<th>DIVISION</th>
<th>VEIN USED?</th>
<th>WHICH ARM?</th>
<th>ARM ZONE</th>
<th>VHP TOOL USED?</th>
<th>REQUESTOR</th>
<th>REASON FOR NOT USING VHP TOOL?</th>
</tr>
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<tbody>
<tr>
<td>CARDIOLOGY</td>
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<td>BASILIC</td>
<td>RIGHT</td>
<td>MID</td>
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<td>DR</td>
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<td>MID</td>
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<td>NURSE</td>
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</tbody>
</table>
Data collection:

• Did the staff use the VHP framework?

• Were staff using it in its entirety? Or parts of it?

• Which elements were most useful?

• Did the framework guide them to reach a clinical decision?

• Did it change their decision-making process?
Data collection

• Are the measurable outcomes favourable?
• Has the project had a positive impact?
‘very easy to use once you had the training’

it gives me a leg to stand on

The tool

Case Scenario
A 74-year-old gentleman admitted with a sub-mandibular abscess. On microbiology review, it was decided that antibiotics are to continue for another 4-6 weeks. During the pre-assessment for a longer-term line, the patient admitted 11 days previously, had 9 PIVCs.
Evaluate Vascular Access Processes to Identify Gaps and Need for Vessel Health and Preservation

Select Unit and Present VHP Program

Implement the Tools and Process in One Unit

Educate Inserters and Unit Staff on Vessel Health and Preservation

Promote Better Communication Between HCW

Evaluate for Compliance and Improvement

(Moureau, 2012)
Integration into Clinical Practice

- Evaluate and monitor for outcome goals
- Assess applying guidelines to daily goals and processes
- Educate
- Select device that promotes preservation of vein and patient resources
- Insert device using best practice bundle
- Insert

Establish education and improved communication with HCW
Evaluate Vascular Access Processes to Identify Gaps and Need for Vessel Health and Preservation

Select Unit and Present VHP Program

Educate Inserters and Unit Staff on Vessel Health and Preservation

Implement the Tools and Process in One Unit

Insert device using best practice bundle

Establish education and improved communication with HCW

Evaluate and monitor for outcome goals

Evaluate for Compliance and Improvement

Promote Better Communication Between HCW

Assess applying guidelines to daily goals and processes

Assess

Insert

Educate

Select

Implementing VHP

Evaluate Vascular Access

Assess
Bibliography


