European Board of Vascular Surgery
Qualification Examination

Julian Scott, David Bergqvist, Examination Committee, Armando Mansilha, Secretary General, Hajo van Bockel, President Section Vasc Surg UEMS
Four parts:

1. Clinical case analyses  60 min.
2. Evaluation scientific competence  30 min.
3. Technical skills assessment  120 min
4. Overall assessment and surgical experience (including logbook)  30 min.

NB: Eligibility for Part II required (e.g. Certificate of Completion of Surgical Training)
Traditional approach Surgical assessment:

- Written / oral exams
- Logbook (operative experience)

Assumptions:

- technical performance does not require assessment
- technical skill: small fraction of the repertoire (e.g. clinical, teamwork, etc)
- experience (numbers) correlates with technical competence

Seems illogical

Any correlation current examination techniques with surgical skill?

- 2002/3: Pilot assessment of technical skill (initiatives: VA Pandey, JHN Wolfe, CD Liapis and D Bergqvist, on behalf of the European Board of Vascular Surgery)
Four aspects of validity

• **Content Validity**
  - Bench stations: dissection, anastomosis, knot tying

• **Construct Validity**
  - Marks for: generic and procedure specific skill

• **Inter-observer Reliability**
  - Candidates marked by two independent examiners

• **Internal Consistency**
  - Correlate operative score (dissection vs anastomosis and knot tying vs total operative scores)
  - Correlate technical skill: log book, viva voce performance

Dissection
Saphenofem junction

Anastomosis
Tibial artery

Knot Tying
Hand movements
Combination of OSATS global rating scale and Task Specific Rating:

- Pandey & Wolfe, 2006
- ICEPS: Imperial College Evaluation of Procedure Specific Skill
Objective structured assessment of technical skill – Global rating scale

<table>
<thead>
<tr>
<th>Surgeon code:</th>
<th>Procedure:</th>
<th>Assessor:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Please circle the candidate's performance on the following scale:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Respect for tissue</td>
<td>Frequently used unnecessary force on tissue or caused damage by inappropriate use of instruments</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Time and motion</td>
<td>Make unnecessary moves</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Instrument handling</td>
<td>Frequently asked for the wrong instrument or used on inappropriate instrument</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Suture handling</td>
<td>Awkward and unsure with repeated arrangement, poor knot tying and inability to maintain tension</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Flow of operation</td>
<td>Frequently stopped operating or needed to discuss the next move</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Knowledge of procedure</td>
<td>Insufficient knowledge. Looked unsure and hesitant</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Overall performance</td>
<td>Very poor</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Quality of final product</td>
<td>Very poor</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

Total score:

---

**Imperial Saphenofemoral Junction Ligation**

**Candidate no:**

**Assessor:**

**Date:**

Please circle the candidate’s performance on the following scale:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incision</td>
<td>Does not use surface landmarks. Inappropriate placement of incision. Poor handling of scalpel</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Dissection</td>
<td>Apparent, secure and excessively hesitant whilst dissecting. Caused trauma to tissues. Did not dissect into the correct anatomical plane</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Retraction</td>
<td>Unclear use of retractors. Did not allow visualisation of important structures, making frequent changes to retractor setting</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Tributaries</td>
<td>Could not or did not try to identify any tributaries</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Haemostasis</td>
<td>Poor quality of knot tying. Knots frequently slipped or was excessively traumatic to vessels</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>SFJ Clearance</td>
<td>Did not identify the Saphenofemoral junction or excessively traumatic dissection around that vessel</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>SFJ Ligation</td>
<td>Did not ligate the SFJ or ligated CFV or caused excessive reattachment onto CFV following SFJ ligation</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

**Total score:**

---

Validation: Technical Skills Part

- **SFJ Ligation**
- **Distal Anastomosis**
- **Knot Tying**

All differences in results significant between the two groups.
Interobserver reliability

Results from pilot examinations

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Istanbul 2002</th>
<th>Dublin 2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>SFJ Ligation</td>
<td>alpha = 0.83</td>
<td>alpha = 0.83</td>
</tr>
<tr>
<td>Distal anastomosis</td>
<td>alpha = 0.80</td>
<td>alpha = 0.89</td>
</tr>
<tr>
<td>Total operative score</td>
<td>alpha = 0.85</td>
<td>alpha = 0.92</td>
</tr>
</tbody>
</table>

(\(\alpha = \text{Cronbach's alpha reliability coefficient;} > 0.8 \text{ for high-stakes assessment required}\))
Internal Consistency: Anastomosis vs SFJ ligation

Participants performed consistently in the examination.

Spearman's rank correlation: $\rho = 0.79$, $P < 0.001$
Internal Consistency: Total score v/d Hand

Participants performed consistently in the examination.

Spearman's rank correlation $Rs = -0.73$, $p < 0.001$.
Internal Consistency: Index Procedures

No Correlation with technical performance
Internal Consistency: Oral Exam performance

No Correlation with technical performance
STRESS – machine (*)

Simulator for Testing Radiological and Endovascular Skills

Not a TRAINING but a TESTING machine. Simple objectives (catheter/guidewires); Contrast, Balloons, Stents not necessary (J. Blankensteijn)
Endovascular Skills Examination

STRESS-machine: schematic drawing

Camera

Plain Abdominal Film

Container with glass model

Light-box
Endovascular Glass Model

RA ostial Stenosis

Straight Side

'Easy' Stenosis

Angulated Side

'Difficult' Stenosis
# Task Specific Endovascular Skills Examination Methods

## Specific Technical Skill

<table>
<thead>
<tr>
<th>Experience Last 12 Months (Incl. Stentgraft)</th>
<th>0-10</th>
<th>10-25</th>
<th>25-50</th>
<th>50-250</th>
<th>&gt;250</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Number of Procedures Assisted (First Assistant)</th>
<th>0-10</th>
<th>10-25*</th>
<th>25-50</th>
<th>50-250</th>
<th>&gt;250*</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Number of Procedures Performed</th>
<th>0-10</th>
<th>10-25*</th>
<th>25-50</th>
<th>50-250</th>
<th>&gt;250**</th>
</tr>
</thead>
</table>

## Examination Methods

|----------------------------------------------|----------------------------------|-----------------------------------------------|-----------------------------------------------|

<table>
<thead>
<tr>
<th>Guide Wire Handling</th>
<th>Force on Guide Wire and/or Advancement in Big Steps and/or Kinking of Guide Wire or Losing of Passage</th>
<th>Occasionally Using Force on Guide Wire, Reasonably Incrementally</th>
<th>No Force, Flawlessly Using Torque Movements on the Guidewire, Incrementally Advancement (Centimeters)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Eye/Fluoro/Hand Movement</th>
<th>Moving Guide Wire or Catheter While Hardly Looking at Screen</th>
<th>Moving Guide Wire or Catheter Occasionally Without Looking at Screen</th>
<th>Never Loosing Eye-Side of Position of Guide Wire or Catheter</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Reaction to Obstruction</th>
<th>Fail to Recognize or Using Force on Guide Wire or Catheter</th>
<th>(Ask for Angiogram), Slow but Correct Passage or Catheter Passage with Minimum of Force on Guide Wire or Catheter</th>
<th>Expedient, Fast Passage, With or Without Use of Angiogram, Without Forcing Guide Wire or Catheter</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Catheter Handling</th>
<th>Using Force on Catheter or Let the Catheter Run Without Guide Wire or Losing of Access After Passage of Obstruction</th>
<th>Advancement in Too Big Steps, Handling Catheter Too Far Away From Sheath</th>
<th>Catheter Close to Sheath for Advancement and for Steering (or at Hub for Steering)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Access to Renal Artery</th>
<th>Fails Within Time Limit Because of Incorrect Technique</th>
<th>Succeeds in Several Attempts, With or Without Correct Technique</th>
<th>Succeeds Quickly With Correct Technique</th>
</tr>
</thead>
</table>

## Total Time

- Total time left groin/right RA: \[\text{min} \text{sec}\]
- Total time right groin/left RA: \[\text{min} \text{sec}\]
The mean total score for novice, intermediate and expert candidates.

The total time versus experience

M. Willems et al. Eur J Vasc Endovasc Surg (2009) 37, 431
EBVS-Q since 1996; Skills Exam since 2004:

- Recognition: accepted as the “standard” FEBVS (Fellow European Board Vascular Surgery)
- Objective, validated and includes technical skills evaluation
- But: expensive (organization, time, and materials)
- Technical skill: independent psychomotor skill that requires an assessment of its own
- FEBVS: skills exam is valid model of assessment of technical skill in an examination setting
Major Contributors EBVS-Q

- David Bergqvist
- Jaap Buth
- Marc Cairols
- Peter Harris
- Christos Liapis
- Bernard Nachbur
- Vicas Pandey
- John Wolfe
- And many others!