Does the mandatory postgraduate UK surgical exam predict selection into higher speciality training?

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Intercollegiate Research Fellow
General surgery StR, Aberdeen Royal Infirmary and University of Aberdeen
Membership of the Royal College of Surgeons (MRCS) exam

- One of the largest postgraduate surgical exams in the world
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- Designed to safeguard patients and ensure high standards
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- One of the largest postgraduate surgical exams in the world
- Designed to safeguard patients and ensure high standards
- Prerequisite for completion of core surgical training and entry into higher speciality training
MRCS

- Part A – written papers
- Part B – OSCE
- Both can be sat from FY1 onwards
MRCS (Part A)

Two 2-hour papers
(135 marks each)

Paper 1
Basic sciences
MCQs

Paper 2
Principles of surgery in general
SBAs
MRCS (Part B)

18 manned stations (9-minutes each)
Total marks 360

Two broad content areas

Applied skills

Knowledge
High-stakes examinations

- Reliable
- Valid
High-stakes examinations

- Reliable
  - reproducible

- Valid
  - how well an assessment measures what it claims to assess
Predictive validity

“able to predict future performance in the specified domain”

(P.D Van Hove et al 2010)
Intercollegiate Committee for Basic Surgical Examinations (ICBSE)

- Responsible for continued development, quality assurance and standards of MRCS in the UK

- Produces an annual report highlighting the exam’s reliability
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- Responsible for continued development, quality assurance and standards of MRCS in the UK
- Produces an annual report highlighting the exam’s reliability
- Yet, unlike other postgraduate UK exams (e.g. MRCP, MRCGP) there has been no analysis of the validity or predictive validity of MRCS
National selection

- Given that MRCS is a perquisite for progression to higher speciality training in the UK

- Determining the relationship between MRCS scores and outcomes in national selection is crucial
National selection

- Given that MRCS is a perquisite for progression to higher speciality training in the UK

- Determining the relationship between MRCS scores and outcomes in national selection is crucial

- One of the largest surgical specialities is general surgery
Aim

To examine the **predictive validity** of MRCS in relation to outcomes in the general and vascular surgery national selection process
Candidates are assessed each year on eight components.
National selection process
General and vascular surgery (ST3)

Candidates are assessed each year on eight components

- Academic, leadership and team working
National selection process
General and vascular surgery (ST3)

Candidates are assessed each year on eight components

• Academic, leadership and team working
• Communication skills and clinical skills
National selection process
General and vascular surgery (ST3)

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- Communication skills and clinical skills
- Clinical management and technical skills
Candidates are assessed each year on eight components

- Academic, leadership and team working
- Communication skills and clinical skills
- Clinical management and technical skills
- Audit and portfolio
Methods

- We included all UK graduates who attempted the selection process from 2011-2015

- Cross-linked selection score with MRCS database
  - Part A & B scores, number of attempts, date of graduation, date of exam
  - Self-declared socio-demographics (gender, ethnicity, DOB, first language)
Methods

- **Pearson correlation coefficients** to examine the linear relationship between each assessment

- **Multiple linear regression analysis** to identify potential independent predictors of national selection ST3 score
1458 interviewed from May 2011 to May 2015
For the general and vascular surgery national selection process
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1231

227 could not be matched
1458 interviewed from May 2011 to May 2015
For the general and vascular surgery national selection process

305 non-UK medical graduates
9 had no GMC number
4 were duplicate names

1231

136
Old MRCS (Parts 1, 2 and 3)

457 excluded

913

777
New MRCS (Parts A and B)

3 missing Part A

227 could not be matched
1458 interviewed from May 2011 to May 2015
For the general and vascular surgery national selection process

305 non-UK medical graduates
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777 matched with national selection scores

774 matched with national selection scores
3 missing Part A

New MRCS (Parts A and B)

457 excluded

Old MRCS (Parts 1, 2 and 3)
Part A score and selection first attempt score

$r=0.21, n=774, p<0.001$
Part B score and selection first attempt score

$r=0.32$, $n=774$, $p<0.001$
## Multiple linear regression analysis – ST3 score

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<thead>
<tr>
<th>Variable</th>
<th>Unstandardised Coefficients</th>
<th>P value</th>
</tr>
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<td>B</td>
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<td>0.97</td>
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<td><strong>Number of Part B MRCS attempts</strong></td>
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<td>-2.93</td>
<td>0.79</td>
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<td>≥3 attempts</td>
<td>-8.11</td>
<td>1.31</td>
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<tr>
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Model $R^2 = 0.18$, n = 598
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Model $R^2 = 0.18$, $n= 598$
# Multiple linear regression analysis – ST3 score

## Model Summary

- **Model R² = 0.18, n = 598**

## Unstandardised Coefficients

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1% of variance
Multiple linear regression analysis – ST3 score

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Model $R^2 = 0.18$, $n = 598$
First attempt at national selection (%) vs. number of attempts at Part B MRCS:

- One attempt: 68% ± 6%
- Two attempts: 66% ± 8%
- ≥Three attempts: 64% ± 12%
Previous minimal appointable scores

First attempt at national selection (%)

Number of attempts at Part B MRCS

- One
- Two
- ≥Three
Conclusions

- Supports validity and predictive validity of MRCS

- 17% of variance in national selection score is explained by Part B MRCS
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- Supports validity and predictive validity of MRCS

- 17% of variance in national selection score is explained by Part B MRCS

- Should Part B MRCS be used as one of the potential selection criteria for entering higher surgical training?
Future work

The relationship between MRCS and...

- Performance in clinical practice e.g. ARCP outcomes
- High-stakes exit exam, FRCS
Acknowledgments

- The 4 Surgical Colleges
- ICBSE
- Iain Targett - lead database administrator, Royal College of Surgeons