Urology Resident Selection: What makes a good resident and what predicts success in our specialty?

Nathan Hoag and Megan Melnyk
January 18, 2012

Objectives

1. Discuss the Canadian Resident Matching Service and the algorithm for matching applicants
2. Assess trends in application and matching rates to urology compared to other surgical specialties
3. Discuss our methods for selecting prospective urology residents and how these can be improved
4. To determine factors used to predict success in a surgical residency program
Residency selection process

- Canadian Resident Matching Service starting in 1994
- Not for profit, runs computer match for medical students and universities
- Medical students apply in their final year
- 2011 – 2528 participants in CaRMS
- 31 programs
- 17 medical schools across Canada

The application:
- Transcripts
- Personal Letter
- Dean’s letter
- CV
- Reference letters
Urology Fair

- Held on a single day, each winter in Toronto
- All English Canadian urology programs participate
- Urology is the only specialty that does this form of interview
- UBC was the last to join the format, in 2001
### Urology Fair

<table>
<thead>
<tr>
<th>Time</th>
<th>UBC candidates</th>
<th>School</th>
<th>SLG rank</th>
<th>AEM rank</th>
<th>WAG rank</th>
<th>Gotto rank</th>
<th>Lee rank</th>
<th>Total Rank score</th>
</tr>
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<tbody>
<tr>
<td>8:00</td>
<td>Allard, Christophe</td>
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<td>Melnyk, Megan</td>
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<td>Elyas, Remon</td>
<td>Queens</td>
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<td>10:00</td>
<td>Bathini, Varsunkumar</td>
<td>Sask</td>
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<td>McGill</td>
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<td>White, Alen</td>
<td>Sask</td>
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<td>Manitoba</td>
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</tbody>
</table>

- **Brainchild of Dr. Michael Jewett**
- **Designed to minimize costs and time away for applicants and faculty**
- **Both pros/cons for this model**
Urology Fair

- Financial costs incurred for applicants were significantly lower than applicants to other surgical specialties
- Costs to programs not significantly different than for holding on-site interviews
- Less days absent from medical school (3.1 vs 9 days)
- Fair participants still get the 2-week blackout period allocated to all medical students in CaRMS

Problems with CaRMS process

Verchere, C. Division Plastic Surgery, UBC. Choosing the Right Resident, BCMJ 2011)

- CaRMS = “one chance to residency”
- Huge commitment for residents (electives, references, interviews)
- Interviews for competitive specialties become “auditions”
- Spend less time and energy in 4th yr learning to become a good doctor
- Should we re-visit the rotating internship?
• 519 residents (45% response) and 112 program directors (84% response) after 1999 AUA Match

• Examined behaviours and attitudes among applicants and programs directors towards AUA urology match

• Does anybody trust anybody?
Inappropriate questions are pervasive in the American urology match process.

The majority of applicants and programs feel lied to by the other side.

Appears to be a lack of remorse, and both sides feel they are “playing the game”
What has CaRMS taught us?

Absolute number of students ranking SURGERY 1st?
Absolute number of students ranking UROLOGY 1st?

Percentage of females choosing Surgery vs Urology as their first choice
Percentage Increase of Applicants vs Spots (2002-2011)

Probability of matching to first choice of Urology
Probability of matching to first choice of Urology by Gender

Summary

• Applicants participating in CaRMS has expanded
• Number of applicants to surgery has increased as has number of positions
• Number of positions in Urology has doubled, however proportion of applicants selecting urology 1st choice decreased
Factors accounting for decreased applicants?

- Poor undergraduate exposure
- Demand for specialties with controllable lifestyles
- Gender shifts in undergraduate medicine
- Lack of role models

*Undergraduate Exposure to Urology: Impact of The Distributed Model of Medical Education in British Columbia*

Hoag NA, et al.

- 56% of students felt inadequate exposure to Urology in undergraduate program
- 41% of students did a rotation in Urology during clerkship

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Can we improve the selection process?
Who are urology residents?

• Drs. MacNeily and Eng studied personality profiles of Canadian urology residents
• Compared to general adult population using NEO personality inventory.

ENG MKH, MACNEILY AE, ALDEN L. The urological personality: is it unique? The Canadian Journal of Urology. 2004;11(5)

Personality testing

• NEO PI-R
• Self-administered inventory of personality traits (240 statements)
The urological personality: is it unique?

Michael K. H. Eng, MD,1 Andrew E. MacNeill, MD,1 Lynn Alden, MD2
1Department of Surgery, Urology, University of British Columbia, Vancouver, BC, Canada
2Department of Psychology, University of British Columbia, Vancouver, BC, Canada

Extraversion p<.001
Openness p<.02
Conscientiousness p<.05
Neuroticism
Agreeableness

Personality testing

<table>
<thead>
<tr>
<th>Trait</th>
<th>Neuroticism</th>
<th>Extraversion</th>
<th>Openness</th>
<th>Agreeableness</th>
<th>Conscientiousness</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>Warm, social, dominant, group leaders</td>
<td>Intellectual curiosity, opposite of dogmatism</td>
<td>Purposeful &amp; determined achievers</td>
<td></td>
<td>But a tendency towards workaholism</td>
</tr>
</tbody>
</table>
Personality testing

Low scores =
- Calm, even tempered,
  deal well with stress

High = dependency
- Good to be average!
- Low = quarrelsome

Trait
- Neuroticism
- Extraversion
- Openness
- Agreeableness
- Conscientiousness

Low scores =
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High = dependency
- Good to be average!
- Low = quarrelsome
Who are urologists?

The surgical personality: comparisons between urologists, non-urologists and non-surgeons

Andrew E. MacNab, MD, FRCS; Lynn Alston, PhD; Eric Webber, MD, FRCS; Kourosh Afshar, MD, FRCS

- “The urologic personality”
- Compared NEO PI- R personality indices between surgeons, urologists, and non-surgeons.
Who are urologists?

Higher scores on gregariousness, activity, excitement seeking, and positive emotions.
The urologist: the life of the party
Edward D. Matsumoto MD, MEd, FRCSC
Can Urol Assoc J 2011

• Should we be selecting for applicants based on extraversion scores?
• Candidate’s personality often at forefront of discussion at urology fair
• Interpersonal skills considered as important as intelligence or technical skills

The urologist: the life of the party
Edward D. Matsumoto MD, MEd, FRCSC
Can Urol Assoc J 2011

• Important in determining the dynamics of a urology residency program
• Often look for candidates with “positive attitude”, “upbeat personality”, or “outgoing nature”.

How to choose the best group of residents?

What tools do we have for selecting resident candidates?

- Written application
- Reference letters
- Transcripts
- Research
- Personal letter
- Candidate interview
- Other activities: hobbies, work, extracurricular activities
How we select our residents: A survey of selection criteria in general surgery residents

General Surgery program directors surveyed regarding importance of selection criteria

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Likert Scale of the Important Criteria</th>
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</thead>
<tbody>
<tr>
<td>Interview</td>
<td>4.69</td>
</tr>
<tr>
<td>USMLE step 1</td>
<td>4.21</td>
</tr>
<tr>
<td>Letter of recommendation</td>
<td>4.02</td>
</tr>
<tr>
<td>USMLE step 2</td>
<td>4.00</td>
</tr>
<tr>
<td>LCME</td>
<td>3.95</td>
</tr>
<tr>
<td>Class ranking</td>
<td>3.47</td>
</tr>
<tr>
<td>Dean’s letter</td>
<td>3.02</td>
</tr>
<tr>
<td>AOA</td>
<td>3.95</td>
</tr>
<tr>
<td>Previous rotation</td>
<td>2.75</td>
</tr>
<tr>
<td>Research</td>
<td>2.62</td>
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<tr>
<td>Publication</td>
<td>2.52</td>
</tr>
<tr>
<td>Graduates of affiliated medical school</td>
<td>2.46</td>
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<tr>
<td>Personal connection with the program</td>
<td>2.22</td>
</tr>
<tr>
<td>Did preliminary year</td>
<td>1.57</td>
</tr>
</tbody>
</table>

Likert scale of 5 points: extremely important—5 points, very important—4 points, important—3 points, somewhat important—2 points, and not important—1 point. AOA, Alpha Omega Alpha.

Techniques for improving resident selection

• Structured behavioural-based interviews:
  • job-specific objectives
  • Essential and desirable knowledge skills
  • Specific competencies
  • Ask applicants about past situations to see if these attributes are present
• Otolaryngology program- performed job analysis of Jr residents and generated list of job-specific objectives, essential knowledge and skills, and competencies specific to this role

• New behaviour-based questions for all applicants in addition to traditional, non-structured interview

• Objective: to determine if behavioural-based interview can improve resident selection process
Conclusion: identifying job-specific skills, knowledge and competencies necessary for successful performance and using the interview process to assess presence of these competencies may improve candidate selection.

Psychology testing

- Can industrial psychology be used to help improve the selection process?
- Well established in the business world and used in the US Air Force.
• Problem with urology fair is that the interview is a 20 minute sound bite

• Even a sociopath can look good in a short interview...are there psych testing methods to make the process more objective?

How can industrial psychology help?

• Identify specific traits desirable in our successful applicants

• Administer tests and create programmed interview questions to measure these traits
Results

- Has been used in plastic surgery, with the psychology testing noted to have changed rank orders
- However, candidates tend not to like these written tests and programmed interviews, which reflects poorly on impression of the program
- Is it ethical or useful to administer these tests to our applicants?

What factors predict who will become a good resident?

- Good at math?
- Magic?
- Focus?
- Intelligence?
- Team sports?
- Leadership?
What factors predict who will become a good resident?

- Judgement?
- Interpersonal Skills?
- Compassion?
- Good Hands?
- Good looks?
- Hard working?

What defines a successful surgical resident?

- Competent technical skills
- Medical knowledge
- CanMEDS
Can residency performance be predicted by candidate selection criteria?

The Relationship between Criteria Used to Select Residents and Performance during Residency

Klara K. Papp, PhD, Hiram C. Polk, Jr MD, J. David Richardson, MD, Louisville, Kentucky

- Examined resident performance (faculty judgment of knowledge, skill, overall ability)
- Pre-Selection Factors:
  - Publication during medical school
  - Research participation
  - National Board Exam marks
  - Honour grades
  - Hobbies (solo vs team sports)
The Relationship between Criteria Used to Select Residents and Performance during Residency

Klara K. Papp, PhD, Hiram C. Polk, Jr. MD, J. David Richardson, MD, Louisville, Kentucky

No relationship between the rank order assigned before residency and the rank order based on performance in residency.

Unable to predict success using criteria available at admission.

4 of the residents in top 10 listed team sports as interests or hobbies (not seen in any bottom 10).
Surgical skill assessment of applicants to General Surgery

- 42 applicants to general surgery program
- Manual dexterity testing on interview (laparoscopic tasks on simulator)
- Simulator scores were compared to internal medicine interns and surgical residents (PGY 2-3)

Panait et al. Journal Surg Research. 2011

Do surgical skills influence resident selection?

<table>
<thead>
<tr>
<th>Laparoscopic Simulator Scores of the Groups of the Three Groups Studied</th>
<th>Cerebro navigation</th>
<th>Instrument navigation</th>
<th>Grasping</th>
<th>Lifting and grasping</th>
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</thead>
<tbody>
<tr>
<td>Surgery residency applicants (n = 42)</td>
<td>79.9 ± 17.8</td>
<td>66.7 ± 20.4</td>
<td>56.8 ± 16.4</td>
<td>37.5 ± 16.6</td>
</tr>
<tr>
<td>Internal medicine PGY 1 (n = 9)</td>
<td>72.8 ± 17.8</td>
<td>78 ± 11.9</td>
<td>79 ± 20.3</td>
<td>61.3 ± 18.0</td>
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<tr>
<td>Surgery residents PGY 2-3 (n = 7)</td>
<td>88.2 ± 10</td>
<td>91.6 ± 9</td>
<td>87.9 ± 5.9</td>
<td>68.1 ± 18.8</td>
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<tr>
<td>P-value</td>
<td>0.08</td>
<td>&lt;0.005</td>
<td>&lt;0.005</td>
<td>0.003</td>
</tr>
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</table>

Data represents mean values ± standard deviation. P values calculated with Kruskal-Wallis test.

There is no self-selection of applicants to a general surgery residency program based on innate or self-perceived surgical skills

Panait et al. Journal Surg Research. 2011
If we can’t reliably predict who will be a successful surgical resident….

Are there factors that predict attrition or poor performance?

Factors Related to Attrition in Surgery Residency Based on Application Data

- Defined success in residency as completion of training and American board exam on first attempt.
- Identified several variables associated with unsatisfactory outcomes
Factors Related to Attrition in Surgery Residency Based on Application Data

Ashok K. Naylor, MD, Joan S. Vock, MD, & James Valicenti, MD

Table 1. Univariate Analysis of Factors Significantly Associated With Attrition Outcome

<table>
<thead>
<tr>
<th>Variable</th>
<th>No. of Participants</th>
<th>Discontinued, No. (%)</th>
<th>p Value</th>
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<td>7 (53.8)</td>
<td>.006</td>
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<td>Sex</td>
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<td>Male</td>
<td>76</td>
<td>14 (18.4)</td>
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<td>Female</td>
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<td>Class rank by quarter</td>
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<td>First</td>
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<td>Second</td>
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<tr>
<td>Third</td>
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<td>Attended courses</td>
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<td>4</td>
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<td>Received letter recommendation</td>
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<td>1</td>
<td>1 (10.0)</td>
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</table>

Conclusions

- The ratio of applicants to positions to our specialty is declining
- Undergraduate exposure to Urology is suboptimal but is paramount for attracting the best candidates
- Urology residents and Urologists are a unique group of people with favourable personality profiles
Conclusions

- Industrial psychology methods may help decrease the subjectivity of ranking applicants and is an area for further research.
- It is difficult to predict success in residency based on application criteria although there are some negative predictors of success.

Thank You!

- Dr Gourlay
- Dr MacNeily

"Nurse, get on the internet, go to SURGERY.COM, scroll down and click on the "Are you totally lost?" icon."