Alignment of fellowship training and job needs in Molecular Genetic Pathology

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INTRODUCTION

In the two decades since ACGME-accredited MGP fellowships have existed and the ABPath has been offering a certification examination, the field has evolved considerably. The ABPath undertook a survey of MGP diplomates participating in Continuing Certification (formerly MOC) to assess the alignment of practice and training needs.

METHODS

From 2017 to 2018, 119 of 327 (36%) eligible MGP diplomates responded to a survey detailing their fellowship training and current professional duties (MGP alone or combined with other pathology subspecialties). Additional survey questions addressed the amount of training received in several areas compared to what was needed for their current jobs. Individual survey question non-response rates ranged from 9% to 13% of the 119 respondents. Half the respondents were between 4 and 7 years of completing training.

Results

Of those diplomates in active practice, 66% were in an academic medical center, and 16% in a non-academic center or central lab; the median group size was 25 FTE pathologists. Approximately 1/3 of diplomates spent most or all of their time on MGP, with another third spending less than 25% of their time doing MGP, and 13% doing none at all. For those dividing MGP duties with other pathology roles, AP sign-out (including hematopathology) was by far the most common combination. This paralleled fellowship training patterns: 28% of diplomates did MGP alone, 23% did MGP with hematopathology and 32% did a combination with surgical pathology or an anatomic pathology subspecialty. Within MGP sign-out duties, sub-specialization is also evident. Methods and applications in MGP have changed significantly with training needs evolving over time. Most respondents felt appropriately trained in many areas, including molecular genetic principles, basic techniques and methods, Sanger sequencing, single gene assays, and FISH for prenatal, heme and solid tumor applications. Similarly, most respondents considered training in preparation for today's practice was adequate for bone marrow engraftment, MSI, cytogenetics, and inherited disease testing; though some had less need for these skills. It is noteworthy that many respondents felt little need for training in molecular microbiology (including detection, sequencing, antimicrobial resistance, virology, or microbiome); genetic counseling; pharmacogenomics; HLA and parentage testing. In contrast, areas commonly identified as important or very important in their current role, but not enough training, were NGS genomic data analysis, assay validation, QA, regulatory, ethical and legal issues, and laboratory management.

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Figure 1. Clinical service time spent on Molecular Pathology

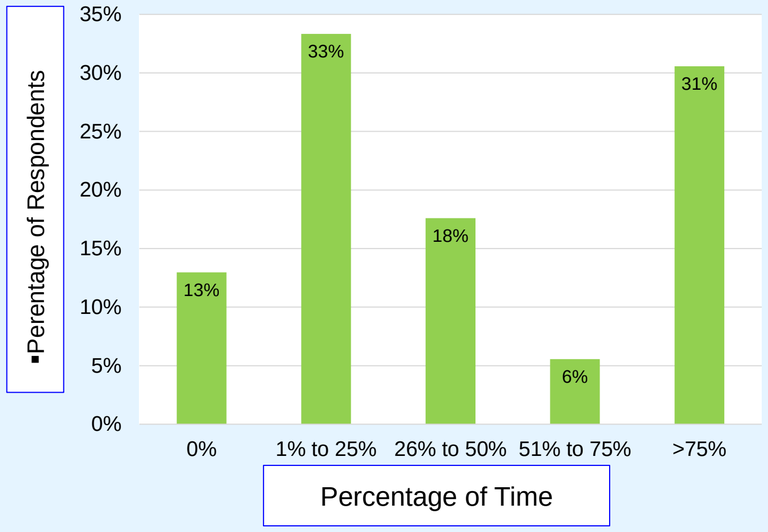

Table 1: Where do MGP diplomates work?

Practice setting	% of respondants
Academic Medical Center	66%
Non-academic Medical Center	13.5%
System Central Lab	3%
Forensic Lab	1%
Military/Government	2%
Physician office	2%
Specialty/POD lab	8%
Stand alone lab	5%

Table 2: Distribution of signout duties

Clinical area	% of respondants	% of time
MGP alone	28	9 (33%): 1-25% 8 (32%): >75%
AP with MGP	32	Variable
Hematopathology	23	Varable
Cytopathology	14	<25%
Forensic/Autopsy	14	<25%
Micro	5	<25%
Chemistry	10	<25%
Transfusion medicine	6	<25%

Table 3: Importance to job and training needs

Topic	Importance to Job	Amount of training
Molecular Genetic Principles	High	About right
Molecular Techniques	High	About right
Single gene assays	High	About right
NGS: Somatic/cancer	High	Not enough
NGS: germline/inherited	Variable	Not enough
Whole exome sequencing	Variable	Almost enough
Whole genome sequencing	Variable	Almost enough
Sanger sequencing	Variable	Enough
Genomic Analysis	High	Not enough
Array CGH	Low	About right
Other arrays	Low	About right
FISH prenatal	Variable	About right
FISH Heme	Variable	About right
Bone Marrow engraftment	Variable	About right
Microsatellite instability	Variable	About right
Inherited diseases	Variable	About right
Cytogenetics	Variable	About right
Genetic Counseling	Moderate/low	About right
Molecular Detection Microbes	Moderate/low	About right
Viral Load Quantitation	Moderate/low	About right
Molecular resistance testing	Low	About right
Microbial Sequencing	Low	About right
Microbiome	Low	None
Pharmacogenomics	Low	About right
HLA	Low	About right
Identity/Parentage	Low	About right
Assay Validation/verification	High	Not enough
QI/QA	High	Not enough
Regulatory requirements	High	Not enough
Ethical issues	High	Not enough
Lab Management	High	Not enough

CONCLUSIONS

There is a biphasic distribution of duties in practice, with equal proportions of diplomates practicing MGP alone vs combined with other disciplines. Certain areas are rarely practiced; MGP combined with AP subspecialties and hematopathology is most common. These data highlight variable and changing training and practice patterns among MGP diplomates, and may be useful in better aligning training and certification with the needs in MGP practice.

ACKNOWLEDGEMENTS: This work was funded by the American Board of Pathology.