



ACGME

Accreditation Council for  
Graduate Medical Education

# MILESTONES

## REPORT 2023

### Medical Genetics and Genomics

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## EXECUTIVE SUMMARY

Since 2013, the Milestones have allowed for continuous tracking of skill and competence development of resident and fellow physicians throughout their graduate medical education (GME) program(s). The Milestones were designed to assist residency and fellowship programs in developing highly competent physicians and meet the 21st-century health care needs of the public. This report is a snapshot of Milestones ratings for the end of the July 1, 2022 through June 30, 2023 academic year. Learning deficits related to the COVID-19 pandemic have been documented and their long-term influence on learning is the subject of ongoing study.

### What's New for 2023

This year's report introduces box plots for the programs that use the Osteopathic Recognition Milestones. Osteopathic Recognition emerged from a collaborative agreement among the ACGME, American Osteopathic Association (AOA), and American Association of Colleges of Osteopathic Medicine (AACOM) as part of the transition to a single GME accreditation system. Launched in 2015, Osteopathic Recognition is available to ACGME-accredited programs that integrate Osteopathic Principles and Practice into the program's curriculum and demonstrate substantial compliance with the ACGME Osteopathic Recognition Requirements. The Osteopathic Recognition Milestones were first published in August 2015. The Osteopathic Recognition Committee (previously called the Osteopathic Principles Committee) first conferred Osteopathic Recognition in November 2015, allowing recognized programs to designate osteopathic residents/fellows and report Osteopathic Recognition Milestones in the ACGME Accreditation Data System (ADS). The 2.0 version of these Milestones was published in August 2021, with implementation in July 2022. See the [Osteopathic Recognition](#) section of the ACGME website for more resources.

Specialties that had a program(s) with Osteopathic Recognition during the 2022-2023 academic year:

- Anesthesiology
- Dermatology
- Diagnostic Radiology
- Emergency Medicine
- Family Medicine
- Internal Medicine
- Neurological Surgery
- Neurology
- Obstetrics and Gynecology
- Orthopaedic Surgery
- Otolaryngology – Head and Neck Surgery
- Pediatrics
- Physical Medicine and Rehabilitation
- Plastic Surgery
- Psychiatry
- Surgery
- Urology
- Internal Medicine-Pediatrics

### General Summary of Findings

- 1) Across all specialties the number of subcompetencies assessed is provided (including Osteopathic Recognition). The ACGME accredited 13,066 programs across 182 specialties and subspecialties, while providing education and training for 158,079 residents and fellows, during the 2022-2023 academic year.
- 2) Across all specialties, box plots show the mean and median of Milestones ratings, as well as the variance, in general attainment across years.

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- 3) Overall rates of straight-lining (which may be an indicator of bias or difficulty interpreting specific milestones within a local context), do not appear to have been significantly affected as many specialties have transitioned to Milestones 2.0.

The ACGME website includes many resources to help understand the purpose and effective use of the Milestones and Milestones ratings. These include the *Milestones Guidebook*, the *Milestones Guidebook for Residents and Fellows*, and Milestones FAQs, as well as the *Assessment Guidebook*, the *Implementation Guidebook*, and the *Clinical Competency Committee Guidebook*, all accessible on the [Resources page](#) of the Milestones section of the ACGME website.

## Intended Audience

The intended audience for this report includes program directors and members of programs' Clinical Competency Committees (CCCs); leaders within specialty societies who oversee the development of national curricula; members of the ACGME Review and Recognition Committees that oversee accreditation and recognition of individual programs; and the residents, fellows, and faculty members in these programs. Other stakeholders who may benefit from this report include specialty boards, designated institutional officials (DIOs), policymakers, and the public.

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**Note:** In this report, page and table numbers align with the full Milestones National Report for ease of reference.

Specialty and subspecialty names align with the way they appear in the specialty-/subspecialty-specific Program Requirements and in the Milestones documents; these names may differ from how they appear in the Accreditation Data System and ACGME Data Resource Book.



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## HOW TO USE THESE FINDINGS

As can be seen in the data, there is a wide range of attainment across milestones. This variance is likely due to differences in curriculum and/or assessment practices. This should be viewed as welcome news, as it is a signal the Milestones data are providing useful information to drive continuous quality improvement (CQI) in GME. Since the launch of the Milestones initiative in 2013, numerous validity studies have been performed to understand the strengths and weaknesses while informing ongoing improvements (Milestones Bibliography 2022). Multiple research studies informed the creation of Milestones 2.0 for every specialty.

All ACGME-accredited specialties/subspecialties, except 15 pediatric subspecialties, implemented Milestones 2.0 by the end of the 2022-2023 academic year, with 55 of those specialties/subspecialties beginning in July 2022. The data in this 2023 report reflect the version of the Milestones used by each specialty during the 2022-2023 academic year.

To learn more about how Milestones are developed and their intended purpose, see the Milestones Guidebook found on the [Resources page](#) of the ACGME website.

The table below provides some specific purposes and functions of the Milestones organized by stakeholder groups.

**Table 1 – Purpose and Function of Milestones**

<b>CONSTITUENCY OR STAKEHOLDER</b>	<b>PURPOSE/FUNCTION</b>
Residents and Fellows	<ul style="list-style-type: none"><li>• Provide a descriptive, developmental roadmap for education and training within a specialty or subspecialty</li><li>• Increase transparency of performance requirements</li><li>• Encourage informed self-directed assessment and self-directed learning</li><li>• Facilitate better feedback</li><li>• Facilitate development of individualized learning plans by residents and fellows</li></ul>
Residency and Fellowship Programs	<ul style="list-style-type: none"><li>• Guide curriculum and assessment tool development and improvements</li><li>• Provide meaningful framework for the CCC (e.g., help create shared mental model)</li><li>• Provide more explicit expectations of residents and fellows</li><li>• Enhance opportunity for early identification of struggling learners</li><li>• Early identification of advanced learners and the need to continuously challenge them</li></ul>
ACGME and the Public	<ul style="list-style-type: none"><li>• Accountability – report at an aggregated national level on competency outcomes</li><li>• Build community for evaluation and research, with focus on CQI</li></ul>
Certification Boards	<ul style="list-style-type: none"><li>• Enable ongoing research to improve certification processes</li></ul>

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## METHODS

Every six months, the ACGME receives more than 3.6 million Milestones ratings of more than 150,000 learners from residency and fellowship programs in more than 150 specialties and subspecialties across the US. The box plots reported in the following pages summarize these data.

## OVERARCHING THEMES

Examining the dataset in terms of gradual progression of competence shows that during the 2022-2023 academic year:

- 1) Generally, across all specialties/subspecialties and all programs, learners show progressive attainment of milestones across time in their program;
- 2) Not all residents/fellows reach Level 4, which is an educational goal and *not* a requirement or mandate, by the time of graduation; and,
- 3) Each specialty/subspecialty shows variation in attainment of the specific Milestones.

Research to date suggests the following possible reasons for these findings:

- 1) Meaningful differences in actual performance;
- 2) Differences in the complexity of the Milestones competency language as written for a particular specialty or subspecialty;
- 3) Differences in understanding and interpretation of the Milestones, especially for the non-Patient Care (PC) and Medical Knowledge (MK) Milestones;
- 4) Differences in clinical exposure in specific competencies of some residents/fellows in some programs;
- 5) Variation in scoring by individual raters and CCCs;
- 6) Differences in the quality of assessment methods;
- 7) Differences in the types of assessment methods used to show attainment of a particular milestone;
- 8) Differences in the combinations of assessment tools used in a program of assessment; and,
- 9) Differences in CCC processes and approaches for determining milestone attainment.

Of course, many other factors may be at play, and these are the subject of ongoing research. The data should only be reported in the context of interpretive statements and assumptions relevant to the particular stakeholder group, (i.e., DIOs, program directors, residents/fellows, the public). It is important to remember that the Milestones are designed for use as formative assessments to be used in the spirit of CQI, and that Level 4 is an educational goal and *not* a requirement or mandate. To fully interpret and understand the results of Milestones analyses and validity studies, there must also be full awareness of the consequences, with appropriate diligence in providing context for proper interpretation of any rating result (Hubley and Zumbo 2011).

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## Straight-Lining Ratings

Straight-lining ratings are defined as a string of identical Milestones ratings for an individual learner across all subcompetencies. In the original vision of the ACGME's current accreditation model, it was assumed that performance across subcompetencies would vary due to contextual factors, curricular design, and variability among learner abilities, according to the content of each subcompetency. For example, a learner would not necessarily be expected to have exactly the same ratings for the milestones in patient care, interpersonal and communication skills, and systems-based practice during a given six-month period. Accurate detection of true variation in ratings would theoretically be useful for tailoring specific feedback to each learner.

It is theoretically possible that an individual learner could be assigned identical Milestone ratings across all subcompetencies (e.g., straight-lining for Milestones in Level 4 can be a valid rating pattern for the senior-most residents who, at the time of graduation, have truly achieved Level 4 in all subcompetencies). However, the data show several instances in which the rate of straight-lining is higher than would be expected, and these rates are presented in Table 4.

**Method:** The rate of straight-lining was calculated as follows: if any resident's or fellow's string of Milestone ratings was identical across all subcompetencies, the resident or fellow was assigned a value of "1;" otherwise, "0." The table provides the percentage of residents or fellows nationally who were assigned a value of "1" (meaning they had received the same rating for all their milestones).

**Interpretation:** Nationally, the ACGME is working to understand whether this straight-lining effect represents true lack of variation in competence, or if CCCs are simply providing similar ratings across subcompetencies for other reasons, such as a belief that the description of individual milestones for some subcompetencies does not fit with their local setting, or they are otherwise having difficulty obtaining valid and defensible ratings through lack of resources or attention to educational assessment within their programs. If a program notes high rates of straight-lining, it would be important for the program director and CCC to reflect on the causes and whether such a Milestones profile is an accurate assessment of the program's residents or fellows.

While most specialties and subspecialties have adopted the 2.0 version of their Milestones, this transition does not appear to have affected the overall rate of straight-lining. These issues continue to be the subject of ongoing qualitative studies with collaborators from various specialties and subspecialties.

## Milestones 2.0

In response to the feedback received and research completed to date, the Milestones language has now been revised across most specialties and subspecialties to make it easier for program directors to understand and implement locally. Additionally, Milestones language was harmonized across specialties and subspecialties, especially for the competencies of Professionalism, Interpersonal and Communication Skills, Systems-Based Practice, and Practice-Based Learning and Improvement (Edgar, Roberts, and Holmboe 2018; Edgar et al. 2018). Most specialties and subspecialties have made the switch to Milestones 2.0 in the 2022-2023 academic year.

## Limitations

While the interpretations and conclusions that can be drawn from the data presented in this report are based on a single point in time (June 2023), trends for stability in the data patterns for academic year-end since June 2014 have recently been examined for the earliest reporting specialties and subspecialties. Most of the Milestones data show signs of stability across this period, which lends greater confidence to the potential interpretations and conclusions that can be drawn from them.

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## Future Directions

The Milestones data show interesting patterns of variation that require further research to understand their full implications. In the meantime, caution should be exercised in how these results are interpreted and communicated to various stakeholders.

## Acknowledgments

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**Table 2 – Number of Subcompetencies by Specialty**

Specialty/Subspecialty Name	Number of Subcompetencies						
	Total	PC	MK	SBP	PBLI	PROF	ICS
Allergy and Immunology	19	4	3	4	2	3	3
Anesthesiology	23	10	2	3	2	3	3
Anesthesiology (Osteopathic Recognition)	7	2	1	1	1	1	1
Adult Cardiothoracic Anesthesiology	23	7	5	3	2	3	3
Critical Care Medicine (multidisciplinary)	19	5	2	3	2	3	4
Obstetric Anesthesiology	20	5	2	3	3	3	4
Pain Medicine (multidisciplinary)	21	6	2	3	3	4	3
Pediatric Anesthesiology	20	7	2	3	2	3	3
Pediatric Cardiac Anesthesiology	21	7	3	3	2	3	3
Regional Anesthesiology and Acute Pain Medicine	17	3	3	3	2	3	3
Colon and Rectal Surgery	27	13	2	3	2	4	3
Dermatology	21	8	2	3	2	3	3
Dermatology (Osteopathic Recognition)	7	2	1	1	1	1	1
Dermatopathology (multidisciplinary)	19	4	3	4	2	3	3
Micrographic Surgery and Dermatologic Oncology	18	4	2	4	2	3	3
Pediatric Dermatology	21	5	2	3	3	4	4
Emergency Medicine	22	8	2	4	2	3	3
Emergency Medicine (Osteopathic Recognition)	7	2	1	1	1	1	1
Emergency Medical Services	19	4	2	5	2	3	3
Medical Toxicology (multidisciplinary)	22	4	5	5	2	3	3
Pediatric Emergency Medicine (multidisciplinary)	24	9	2	4	2	4	3
Sports Medicine (multidisciplinary)	20	6	3	3	2	3	3
Undersea and Hyperbaric Medicine (multidisciplinary)	22	4	4	5	3	3	3
Family Medicine	19	5	2	4	2	3	3
Family Medicine (Osteopathic Recognition)	7	2	1	1	1	1	1
Clinical Informatics (multidisciplinary)	21	2	2	3	5	5	4
Geriatric Medicine (multidisciplinary)	22	6	2	4	2	4	4
Hospice and Palliative Medicine (multidisciplinary)	20	4	3	4	2	3	4
Sports Medicine (multidisciplinary)	20	6	3	3	2	3	3
Sports Medicine (multidisciplinary, Osteopathic Recognition)	7	2	1	1	1	1	1
Internal Medicine	21	6	3	3	2	4	3
Internal Medicine (Osteopathic Recognition)	7	2	1	1	1	1	1
Adult Congenital Heart Disease	19	5	2	3	2	3	4
Advanced Heart Failure and Transplant Cardiology	21	5	5	3	2	3	3
Cardiovascular Disease	17	4	2	3	2	3	3
Clinical Cardiac Electrophysiology	24	9	4	3	2	3	3
Clinical Informatics (multidisciplinary)	21	2	2	3	5	5	4
Critical Care Medicine	19	4	2	4	2	3	4
Endocrinology, Diabetes, and Metabolism	19	6	2	3	2	3	3
Gastroenterology	17	4	2	3	2	3	3
Gastroenterology (Dual Gastroenterology/Transplant Hepatology Pathway)	22	7	4	3	2	3	3

**Table 2 – Number of Subcompetencies by Specialty**

Specialty/Subspecialty Name	Number of Subcompetencies						
	Total	PC	MK	SBP	PBLI	PROF	ICS
Geriatric Medicine (multidisciplinary)	22	6	2	4	2	4	4
Hematology and Medical Oncology	22	5	4	5	2	3	3
Infectious Disease	23	3	6	5	2	4	3
Interventional Cardiology	17	3	3	3	2	3	3
Nephrology	22	7	3	4	2	3	3
Pulmonary Disease	19	4	2	4	2	3	4
Pulmonary Disease and Critical Care Medicine	20	5	2	4	2	3	4
Rheumatology	21	6	3	3	2	4	3
Sleep Medicine (multidisciplinary)	18	4	2	3	2	3	4
Transplant Hepatology	16	3	2	3	2	3	3
Medical Genetics and Genomics	17	3	3	3	2	3	3
Clinical Biochemical Genetics	19	4	2	5	2	3	3
Laboratory Genetics and Genomics	19	4	2	5	2	3	3
Medical Biochemical Genetics	16	3	2	3	2	3	3
Molecular Genetic Pathology (multidisciplinary)	22	3	4	6	3	3	3
Neurological Surgery	20	8	2	3	3	2	2
Neurology	27	12	2	4	2	3	4
Clinical Neurophysiology	28	9	5	4	2	3	5
Epilepsy	24	7	3	4	2	3	5
Neurocritical Care (multidisciplinary)	24	6	4	4	2	3	5
Neurodevelopmental Disabilities	32	10	5	6	2	5	4
Neuromuscular Medicine (multidisciplinary)	27	10	4	4	2	3	4
Vascular Neurology	25	5	7	4	2	3	4
Child Neurology	26	10	4	3	2	3	4
Nuclear Medicine	22	5	5	4	2	3	3
Obstetrics and Gynecology	32	14	2	6	2	4	4
Obstetrics and Gynecology (Osteopathic Recognition)	7	2	1	1	1	1	1
Complex Family Planning	25	6	3	5	3	4	4
Female Pelvic Medicine and Reconstructive Surgery (multidisciplinary)	28	7	8	3	3	3	4
Gynecologic Oncology	27	5	8	4	3	3	4
Maternal-Fetal Medicine	26	5	4	6	3	4	4
Reproductive Endocrinology and Infertility	22	3	5	4	3	3	4
Ophthalmology	20	6	3	3	2	3	3
Orthopaedic Surgery	20	7	2	3	2	3	3
Orthopaedic Surgery (Osteopathic Recognition)							
Adult Reconstructive Orthopaedic Surgery	18	5	2	3	2	3	3
Foot and Ankle Orthopaedic Surgery	21	6	4	3	2	3	3
Hand Surgery (multidisciplinary)	20	5	4	3	2	3	3
Musculoskeletal Oncology	18	3	2	3	3	3	4
Orthopaedic Sports Medicine	18	5	2	3	2	3	3
Orthopaedic Surgery of the Spine	19	6	2	3	2	3	3
Orthopaedic Trauma	21	5	5	3	2	3	3

**Table 2 – Number of Subcompetencies by Specialty**

Specialty/Subspecialty Name	Number of Subcompetencies						
	Total	PC	MK	SBP	PBLI	PROF	ICS
Pediatric Orthopaedic Surgery	23	6	6	3	2	3	3
Osteopathic Neuromusculoskeletal Medicine	18	5	2	3	2	3	3
Otolaryngology – Head and Neck Surgery	23	9	3	3	2	3	3
Otolaryngology – Head and Neck Surgery (Osteopathic Recognition)	7	2	1	1	1	1	1
Neurotology	19	5	3	3	2	3	3
Pediatric Otolaryngology	19	6	2	3	2	3	3
Pathology (Anatomic and Clinical)	21	6	2	5	2	3	3
Blood Banking/Transfusion Medicine	23	4	6	5	2	3	3
Clinical Informatics (multidisciplinary)	21	2	2	3	5	5	4
Cytopathology	21	6	2	5	2	3	3
Forensic Pathology	19	2	3	5	2	3	4
Hematopathology	23	4	6	5	2	3	3
Medical Microbiology	21	3	4	6	2	3	3
Neuropathology	20	4	3	5	2	3	3
Pediatric Pathology	19	4	2	5	2	3	3
Selective Pathology (Focused Anatomic)	19	4	2	5	2	3	3
Selective Pathology (Surgical)	19	4	2	5	2	3	3
Pediatrics	22	5	2	6	2	4	3
Pediatrics (Osteopathic Recognition)	7	2	1	1	1	1	1
Adolescent Medicine	21	4	1	5	4	4	3
Child Abuse Pediatrics	21	4	1	5	4	4	3
Clinical Informatics (multidisciplinary)	21	2	2	3	5	5	4
Developmental-Behavioral Pediatrics	21	4	1	5	4	4	3
Neonatal-Perinatal Medicine	21	4	1	5	4	4	3
Pediatric Cardiology	21	4	1	5	4	4	3
Pediatric Critical Care Medicine	21	4	1	5	4	4	3
Pediatric Emergency Medicine (multidisciplinary)	24	9	2	4	2	4	3
Pediatric Endocrinology	21	4	1	5	4	4	3
Pediatric Gastroenterology	21	4	1	5	4	4	3
Pediatric Hematology/Oncology	21	4	1	5	4	4	3
Pediatric Hospital Medicine	21	4	1	5	4	4	3
Pediatric Infectious Diseases	21	4	1	5	4	4	3
Pediatric Nephrology	21	4	1	5	4	4	3
Pediatric Pulmonology	21	4	1	5	4	4	3
Pediatric Rheumatology	21	4	1	5	4	4	3
Pediatric Transplant Hepatology	21	4	1	5	4	4	3
Sports Medicine (multidisciplinary)	20	6	3	3	2	3	3
Physical Medicine and Rehabilitation	24	8	2	4	2	5	3
Brain Injury Medicine (multidisciplinary)	23	6	3	4	2	5	3
Pediatric Rehabilitation Medicine	24	8	2	4	2	5	3
Spinal Cord Injury Medicine	23	5	3	4	2	5	4
Sports Medicine (multidisciplinary)	20	6	3	3	2	3	3





**Table 3 – Number of Residents/Fellows by Year in Program**

Specialty/Subspecialty Name	Total	Resident/Fellow Year						
		1	2	3	4	5	6	7
Allergy and Immunology	325	162	163					
Anesthesiology	7,255	1,501	1,971	1,922	1,861			
Anesthesiology (Osteopathic Recognition)	29	7	8	7	7			
Adult Cardiothoracic Anesthesiology	258	258						
Critical Care Medicine (multidisciplinary)	219	219						
Obstetric Anesthesiology	51	51						
Pain Medicine (multidisciplinary)	421	421						
Pediatric Anesthesiology	195	195						
Pediatric Cardiac Anesthesiology	22	22						
Regional Anesthesiology and Acute Pain Medicine	94	94						
Colon and Rectal Surgery	110	110						
Dermatology	1,564	536	522	506				
Dermatology (Osteopathic Recognition)	21	7	7	7				
Dermatopathology (multidisciplinary)	77	77						
Micrographic Surgery and Dermatologic Oncology	91	91						
Pediatric Dermatology	22	22						
Emergency Medicine (Three-Year Programs)	6,705	2,344	2,274	2,087				
Emergency Medicine (Four-Year Programs)	2,659	682	670	647	660			
Emergency Medicine (Four-Year Programs) (Osteopathic Recognition)	131	29	35	31	36			
Emergency Medical Services	98	98						
Medical Toxicology (multidisciplinary)	93	53	40					
Pediatric Emergency Medicine (multidisciplinary)	143	53	51	39				
Sports Medicine (multidisciplinary)	18	18						
Undersea and Hyperbaric Medicine (multidisciplinary)	12	12						
Family Medicine	14,697	5,067	4,929	4,701				
Family Medicine (Osteopathic Recognition)	1,719	597	570	552				
Clinical Informatics (multidisciplinary)	22	10	12					
Geriatric Medicine (multidisciplinary)	45	45						
Hospice and Palliative Medicine (multidisciplinary)	490	490						
Sports Medicine (multidisciplinary)	294	294						
Sports Medicine (multidisciplinary, Osteopathic Recognition)	12	12						
Internal Medicine	31,994	12,391	10,077	9,526				
Internal Medicine (Osteopathic Recognition)	382	134	125	123				
Adult Congenital Heart Disease	30	14	16					
Advanced Heart Failure and Transplant Cardiology	98	98						
Cardiovascular Disease	3,462	1,238	1,131	1,093				
Clinical Cardiac Electrophysiology	332	183	149					
Clinical Informatics (multidisciplinary)	65	40	25					
Critical Care Medicine	360	217	143					
Endocrinology, Diabetes, and Metabolism	721	380	341					
Gastroenterology	1,947	698	649	600				

**Table 3 – Number of Residents/Fellows by Year in Program**

Specialty/Subspecialty Name	Total	Resident/Fellow Year						
		1	2	3	4	5	6	7
Gastroenterology (Gastroenterology/Transplant Hepatology Pathway)	27	1	9	17				
Geriatric Medicine (multidisciplinary)	277	277						
Hematology and Medical Oncology	2,107	744	703	660				
Infectious Disease	831	436	395					
Interventional Cardiology	377	377						
Nephrology	878	463	415					
Pulmonary Disease	65	36	29					
Pulmonary Disease and Critical Care Medicine	2,267	833	749	685				
Rheumatology	554	301	253					
Sleep Medicine (multidisciplinary)	217	217						
Transplant Hepatology	48	48						
Medical Genetics and Genomics	66	35	31					
Clinical Biochemical Genetics	13	8	5					
Laboratory Genetics and Genomics	75	43	32					
Medical Biochemical Genetics	17	17						
Molecular Genetic Pathology (multidisciplinary)	60	60						
Neurological Surgery	1,601	246	238	235	226	215	219	222
Neurology	3,539	681	1,026	948	884			
Clinical Neurophysiology	161	161						
Epilepsy	159	159						
Neurocritical Care (multidisciplinary)	115	66	49					
Neurodevelopmental Disabilities	31	8	7	9	7			
Neuromuscular Medicine (multidisciplinary)	79	79						
Vascular Neurology	193	193						
Child Neurology	483	171	167	145				
Nuclear Medicine	77	38	21	18				
Obstetrics and Gynecology	5,995	1,578	1,502	1,481	1,434			
Obstetrics and Gynecology (Osteopathic Recognition)	80	21	19	20	20			
Complex Family Planning	55	29	26					
Female Pelvic Medicine and Reconstructive Surgery (multidisciplinary)	155	57	51	47				
Gynecologic Oncology	241	84	79	78				
Maternal-Fetal Medicine	417	147	139	131				
Reproductive Endocrinology and Infertility	175	57	60	58				
Ophthalmology	1,739	203	530	517	489			
Orthopaedic Surgery	4,496	902	911	901	882	900		
Orthopaedic Surgery (Osteopathic Recognition)	92	18	17	18	19	20		
Adult Reconstructive Orthopaedic Surgery	52	52						
Foot and Ankle Orthopaedic Surgery	16	16						
Hand Surgery (multidisciplinary)	161	161						
Musculoskeletal Oncology	16	16						
Orthopaedic Sports Medicine	225	225						

**Table 3 – Number of Residents/Fellows by Year in Program**

Specialty/Subspecialty Name	Total	Resident/Fellow Year						
		1	2	3	4	5	6	7
Orthopaedic Surgery of the Spine	25	25						
Orthopaedic Trauma	20	20						
Pediatric Orthopaedic Surgery	39	39						
Osteopathic Neuromusculoskeletal Medicine	85	16	22	47				
Otolaryngology – Head and Neck Surgery	1,794	379	364	365	348	338		
Otolaryngology – Head and Neck Surgery (Osteopathic Recognition)	25	5	5	5	5	5		
Neurotology	37	19	18					
Pediatric Otolaryngology	40	40						
Pathology (Anatomic and Clinical)	2,345	650	617	574	504			
Blood Banking/Transfusion Medicine	47	47						
Clinical Informatics (multidisciplinary)	23	12	11					
Cytopathology	116	116						
Forensic Pathology	59	59						
Hematopathology	141	141						
Medical Microbiology	14	14						
Neuropathology	56	33	23					
Pediatric Pathology	23	23						
Selective Pathology (Focused Anatomic)	104	104						
Selective Pathology (Surgical)	75	75						
Pediatrics	9,562	3,332	3,228	3,002				
Pediatrics (Osteopathic Recognition)	34	13	10	11				
Adolescent Medicine	92	40	25	27				
Child Abuse Pediatrics	59	29	18	12				
Clinical Informatics (multidisciplinary)	28	17	11					
Developmental-Behavioral Pediatrics	106	42	36	28				
Neonatal-Perinatal Medicine	831	304	283	244				
Pediatric Cardiology	486	172	164	150				
Pediatric Critical Care Medicine	620	221	204	195				
Pediatric Emergency Medicine (multidisciplinary)	453	176	143	134				
Pediatric Endocrinology	251	89	79	83				
Pediatric Gastroenterology	343	125	109	109				
Pediatric Hematology/Oncology	463	160	151	152				
Pediatric Hospital Medicine	191	108	83					
Pediatric Infectious Diseases	195	70	59	66				
Pediatric Nephrology	145	47	57	41				
Pediatric Pulmonology	196	79	63	54				
Pediatric Rheumatology	109	38	35	36				
Pediatric Transplant Hepatology	12	12						
Sports Medicine (multidisciplinary)	28	28						
Physical Medicine and Rehabilitation	1,646	187	504	501	454			
Brain Injury Medicine (multidisciplinary)	24	24						
Pediatric Rehabilitation Medicine	42	28	14					

**Table 3 – Number of Residents/Fellows by Year in Program**

Specialty/Subspecialty Name	Total	Resident/Fellow Year						
		1	2	3	4	5	6	7
Spinal Cord Injury Medicine	25	25						
Sports Medicine (multidisciplinary)	41	41						
Plastic Surgery - Independent	202	68	67	67				
Plastic Surgery - Integrated	1,111	197	201	188	181	178	166	
Hand Surgery (multidisciplinary)	27	27						
Preventive Medicine (Aerospace Medicine)	52	21	31					
Preventive Medicine (Occupational Medicine)	120	68	52					
Preventive Medicine (Public Health and General Preventive Medicine)	185	98	87					
Psychiatry	7,748	2,154	2,097	2,008	1,489			
Addiction Medicine (multidisciplinary)	177	177						
Addiction Psychiatry	93	93						
Child and Adolescent Psychiatry	974	515	459					
Forensic Psychiatry	76	76						
Geriatric Psychiatry	65	65						
Consultation-Liaison Psychiatry	92	92						
Radiation Oncology	764	191	186	199	188			
Diagnostic Radiology	4,481	1,136	1,127	1,121	1,097			
Abdominal Radiology	50	50						
Musculoskeletal Radiology	39	39						
Neuroradiology	305	305						
Nuclear Radiology	12	12						
Pediatric Radiology	59	59						
Interventional Radiology - Independent	178	132	46					
Interventional Radiology - Integrated	715	155	148	148	132	132		
Surgery	9,601	2,962	1,891	1,677	1,563	1,508		
Surgery (Osteopathic Recognition)	54	11	10	13	10	10		
Complex General Surgical Oncology	128	67	61					
Pediatric Surgery	88	41	47					
Surgical Critical Care	350	350						
Vascular Surgery - Independent	272	137	135					
Vascular Surgery - Integrated	382	86	86	83	62	65		
Thoracic Surgery - Independent (Two-Year Programs)	153	76	77					
Thoracic Surgery - Independent (Three-Year Programs)	105	35	39	31				
Thoracic Surgery - Integrated	240	47	46	43	39	33	32	
Urology	1,833	386	376	360	362	349		
Female Pelvic Medicine and Reconstructive Surgery (multidisciplinary)	42	16	18	8				
Pediatric Urology	33	15	18					
Transitional Year	1,897	1,897						
Transitional Year (Osteopathic Recognition)	21	21						
Internal Medicine - Pediatrics	1,541	396	392	385	368			

**Table 4 – Rate of Straight-Lining (June 2023)**

Specialty/Subspecialty Name	Number of Subcomp	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7
Allergy and Immunology (325)	19	9.9%	14.1%					
Anesthesiology (7,254)	23	27.4%	22.5%	24.7%	31.5%			
Adult Cardiothoracic Anesthesiology (258)	23	28.7%						
Critical Care Medicine (multidisciplinary) (219)	19	16.0%						
Obstetric Anesthesiology (51)	20	13.7%						
Pain Medicine (multidisciplinary) (421)	21	26.1%						
Pediatric Anesthesiology (195)	20	16.9%						
Pediatric Cardiac Anesthesiology (22)	21	9.1%						
Regional Anesthesiology and Acute Pain Medicine (94)	17	31.9%						
Colon and Rectal Surgery (110)	27	12.7%						
Dermatology (1,564)	21	13.8%	14.2%	20.6%				
Dermatopathology (multidisciplinary) (77)	19	16.9%						
Micrographic Surgery and Dermatologic Oncology (91)	18	25.3%						
Pediatric Dermatology (22)	21	22.7%						
Emergency Medicine (Three-Year Programs) (6,669)	22	14.2%	13.0%	22.3%				
Emergency Medicine (Four-Year Programs) (2,657)	22	16.7%	11.5%	17.0%	20.0%			
Emergency Medical Services (98)	19	12.2%						
Medical Toxicology (multidisciplinary) (93)	22	0.0%	10.0%					
Pediatric Emergency Medicine (multidisciplinary) (143)	24	0.0%	5.9%	7.7%				
Sports Medicine (multidisciplinary) (18)	20	5.6%						
Undersea and Hyperbaric Medicine (multidisciplinary) (12)	22	0.0%						
Family Medicine (14,678)	19	7.6%	7.2%	10.5%				
Clinical Informatics (multidisciplinary) (22)	21	0.0%	0.0%					
Geriatric Medicine (multidisciplinary) (45)	22	4.4%						
Hospice and Palliative Medicine (multidisciplinary) (490)	20	10.4%						
Sports Medicine (multidisciplinary) (294)	20	7.5%						
Internal Medicine (31,993)	21	15.0%	14.4%	23.2%				
Adult Congenital Heart Disease (30)	19	7.1%	18.8%					
Advanced Heart Failure and Transplant Cardiology (93)	21	31.2%						
Cardiovascular Disease (3,430)	17	21.6%	24.4%	35.1%				
Clinical Cardiac Electrophysiology (328)	24	10.4%	25.3%					
Clinical Informatics (multidisciplinary) (65)	21	0.0%	0.0%					
Critical Care Medicine (360)	19	13.8%	21.0%					
Endocrinology, Diabetes, and Metabolism (717)	19	2.9%	10.3%					
Gastroenterology (1938)	17	13.7%	17.6%	31.9%				
Gastroenterology (Dual Gastroenterology/Transplant Hepatology Pathway) (54)	22	0.0%	33.3%	29.4%				
Geriatric Medicine (multidisciplinary) (276)	22	12.0%						

**Table 4 – Rate of Straight-Lining (June 2023)**

Specialty/Subspecialty Name	Number of Subcomp	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7
Hematology and Medical Oncology (2101)	22	11.7%	15.8%	23.1%				
Infectious Disease (827)	23	6.2%	13.7%					
Interventional Cardiology (375)	17	38.7%						
Nephrology (878)	22	6.0%	18.6%					
Medical Oncology (10)	21	20.0%	40.0%					
Pulmonary Disease (65)	19	22.2%	24.1%					
Pulmonary Disease and Critical Care Medicine (2,261)	20	14.6%	15.4%	23.6%				
Rheumatology (554)	21	7.0%	15.4%					
Sleep Medicine (multidisciplinary) (217)	18	19.8%						
Transplant Hepatology (48)	16	18.8%						
Medical Genetics and Genomics (66)	17	0.0%	19.4%					
Clinical Biochemical Genetics (13)	19	0.0%	0.0%					
Laboratory Genetics and Genomics (75)	19	9.3%	9.4%					
Medical Biochemical Genetics (17)	16	11.8%						
Molecular Genetic Pathology (multidisciplinary) (60)	22	15.0%						
Neurological Surgery (1,601)	20	13.0%	10.1%	8.9%	8.8%	9.3%	15.5%	9.0%
Neurology (3,539)	27	5.1%	5.1%	8.3%	15.6%			
Clinical Neurophysiology (161)	28	5.6%						
Epilepsy (157)	24	16.6%						
Neurocritical Care (multidisciplinary) (115)	24	3.0%	4.1%					
Neurodevelopmental Disabilities (31)	32	25.0%	0.0%	0.0%	28.6%			
Neuromuscular Medicine (multidisciplinary) (79)	27	5.1%						
Vascular Neurology (191)	25	13.6%						
Child Neurology (483)	26	3.5%	1.2%	10.3%				
Nuclear Medicine (75)	22	13.5%	0.0%	38.9%				
Obstetrics and Gynecology (5,995)	32	5.5%	5.0%	4.1%	15.8%			
Complex Family Planning (55)	25	0.0%	0.0%					
Female Pelvic Medicine and Reconstructive Surgery (multidisciplinary) (155)	28	1.8%	0.0%	2.1%				
Gynecologic Oncology (237)	27	0.0%	2.6%	9.2%				
Maternal-Fetal Medicine (417)	26	4.1%	2.9%	12.2%				
Reproductive Endocrinology and Infertility (175)	22	0.0%	0.0%	8.6%				
Ophthalmology (1726)	20	21.2%	12.9%	13.9%	21.4%			
Orthopaedic Surgery (4,488)	20	20.7%	18.2%	22.3%	28.0%	33.3%		
Adult Reconstructive Orthopaedic Surgery (52)	18	32.7%						
Foot and Ankle Orthopaedic Surgery (16)	21	56.3%						
Hand Surgery (multidisciplinary) (161)	20	29.2%						
Musculoskeletal Oncology (16)	18	31.3%						
Orthopaedic Sports Medicine (225)	18	28.4%						
Orthopaedic Surgery of the Spine (25)	19	40.0%						
Orthopaedic Trauma (20)	21	50.0%						
Pediatric Orthopaedic Surgery (39)	23	12.8%						
Osteopathic Neuromusculoskeletal Medicine (85)	18	0.0%	4.5%	0.0%				

**Table 4 – Rate of Straight-Lining (June 2023)**

Specialty/Subspecialty Name	Number of Subcomp	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7
Otolaryngology – Head and Neck Surgery (1,779)	23	9.8%	6.6%	6.1%	7.2%	13.7%		
Neurotology (35)	19	0.0%	35.3%					
Pediatric Otolaryngology (40)	19	5.0%						
Pathology (Anatomic and Clinical) (2,345)	21	11.1%	9.4%	12.4%	19.2%			
Blood Banking/Transfusion Medicine (47)	23	2.1%						
Clinical Informatics (multidisciplinary) (23)	21	8.3%	0.0%					
Cytopathology (115)	21	7.0%						
Forensic Pathology (58)	19	5.2%						
Hematopathology (141)	23	9.9%						
Medical Microbiology (14)	21	28.6%						
Neuropathology (56)	20	9.1%	13.0%					
Pediatric Pathology (23)	19	4.3%						
Selective Pathology (Focused Anatomic) (104)	19	27.9%						
Selective Pathology (Surgical) (75)	19	9.3%						
Pediatrics (9,530)	22	4.1%	5.0%	8.0%				
Adolescent Medicine (92)	21	2.5%	4.0%	7.4%				
Child Abuse Pediatrics (59)	21	6.9%	0.0%	8.3%				
Clinical Informatics (multidisciplinary) (28)	21	0.0%	0.0%					
Developmental-Behavioral Pediatrics (106)	21	4.8%	5.6%	7.1%				
Neonatal-Perinatal Medicine (831)	21	3.6%	3.5%	16.4%				
Pediatric Cardiology (486)	21	8.7%	9.8%	12.0%				
Pediatric Critical Care Medicine (620)	21	5.4%	3.9%	11.8%				
Pediatric Emergency Medicine (multidisciplinary) (453)	24	2.3%	3.5%	6.0%				
Pediatric Endocrinology (251)	21	4.5%	2.5%	8.4%				
Pediatric Gastroenterology (343)	21	9.6%	13.8%	16.5%				
Pediatric Hematology/Oncology (463)	21	5.6%	5.3%	13.2%				
Pediatric Hospital Medicine (189)	21	1.9%	6.1%					
Pediatric Infectious Diseases (195)	21	1.4%	1.7%	4.5%				
Pediatric Nephrology (145)	21	10.6%	8.8%	12.2%				
Pediatric Pulmonology (196)	21	3.8%	7.9%	14.8%				
Pediatric Rheumatology (109)	21	0.0%	2.9%	11.1%				
Pediatric Transplant Hepatology (12)	21	0.0%						
Sports Medicine (multidisciplinary) (28)	20	3.6%						
Physical Medicine and Rehabilitation (1,646)	24	8.6%	7.3%	11.6%	18.7%			
Brain Injury Medicine (multidisciplinary) (24)	23	4.2%						
Pediatric Rehabilitation Medicine (42)	24	0.0%	7.1%					
Spinal Cord Injury Medicine (23)	23	26.1%						
Sports Medicine (multidisciplinary) (41)	20	12.2%						
Plastic Surgery - Independent (202)	22	4.4%	9.0%	17.9%				
Plastic Surgery - Integrated (1,111)	22	17.8%	14.4%	14.4%	14.9%	13.5%	22.3%	
Hand Surgery (multidisciplinary) (27)	20	14.8%						
Preventive Medicine (Aerospace Medicine) (52)	20	0.0%	9.7%					
Preventive Medicine (Occupational Medicine) (120)	21	4.4%	1.9%					



**Table 4 – Rate of Straight-Lining (June 2023)**

Specialty/Subspecialty Name	Number of Subcomp	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7
Preventive Medicine (Public Health and General Preventive Medicine) (185)	20	0.0%	2.3%					
Psychiatry (7,748)	21	12.4%	12.0%	13.8%	19.3%			
Addiction Medicine (multidisciplinary) (173)	16	13.3%						
Addiction Psychiatry (93)	17	14.0%						
Child and Adolescent Psychiatry (974)	23	4.1%	8.9%					
Forensic Psychiatry (76)	17	10.5%						
Geriatric Psychiatry (65)	20	15.4%						
Consultation-Liaison Psychiatry (92)	16	8.7%						
Radiation Oncology (764)	21	15.2%	19.4%	24.1%	28.2%			
Diagnostic Radiology (4,481)	24	37.8%	28.8%	30.8%	41.8%			
Abdominal Radiology (50)	20	20.0%						
Musculoskeletal Radiology (39)	22	25.6%						
Neuroradiology (305)	21	25.2%						
Nuclear Radiology (12)	20	41.7%						
Pediatric Radiology (59)	20	10.2%						
Interventional Radiology - Independent (178)	24	25.8%	19.6%					
Interventional Radiology - Integrated (715)	31	37.4%	30.4%	35.1%	32.6%	34.8%		
Surgery (9,563)	18	26.9%	18.3%	17.0%	18.3%	33.1%		
Complex General Surgical Oncology (113)	23	15.0%	18.9%					
Pediatric Surgery (88)	25	14.6%	10.6%					
Surgical Critical Care (350)	25	16.3%						
Vascular Surgery - Independent (268)	28	5.2%	24.1%					
Vascular Surgery - Integrated (380)	28	16.5%	14.1%	8.4%	16.1%	32.3%		
Thoracic Surgery- Independent (Two-Year Programs) (153)	23	6.6%	5.2%					
Thoracic Surgery - Independent (Three-Year Programs) (105)	23	0.0%	12.8%	12.9%				
Congenital Cardiac Surgery (9)	17	11.1%						
Thoracic Surgery - Integrated (240)	24	14.9%	10.9%	4.7%	10.3%	15.2%	25.0%	
Urology (1,833)	20	17.9%	10.6%	11.4%	13.5%	26.4%		
Female Pelvic Medicine and Reconstructive Surgery (multidisciplinary) (42)	28	0.0%	0.0%	0.0%				
Pediatric Urology (33)	21	13.3%	16.7%					
Transitional Year (1,897)	19	19.9%						

Note: The following specialties and subspecialties do not contain data and are not included within the data report due to being a newly designated program or containing an insufficient number of learners.

### Overall

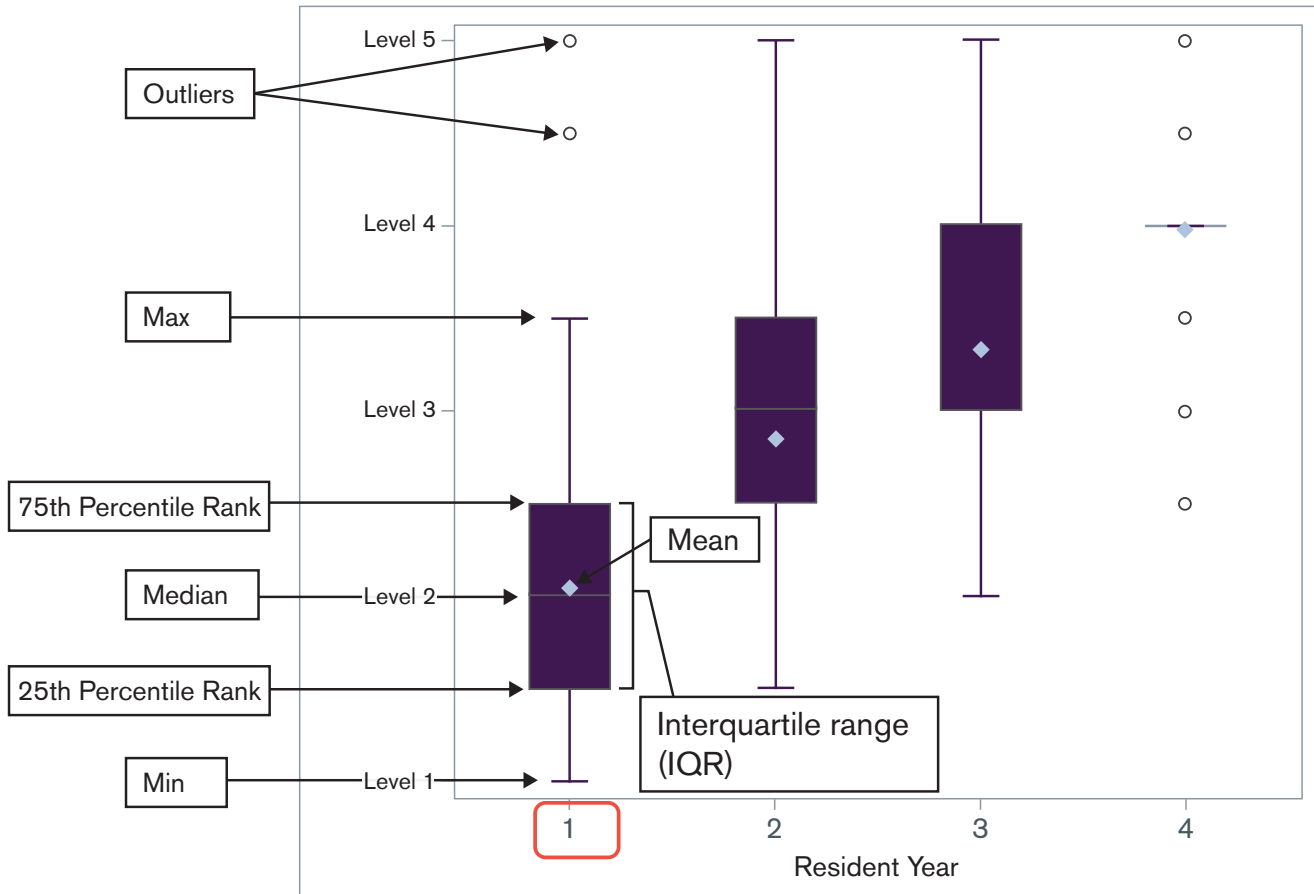
- Medical Oncology
- Neuroendovascular Intervention (Neurological Surgery)
- Neuroendovascular Intervention (Neurology)
- Neuroendovascular Intervention (Radiology)
- Ophthalmic Plastic and Reconstructive Surgery
- Chemical Pathology
- Selective Pathology
- Craniofacial Surgery
- Undersea and Hyperbaric Medicine (multidisciplinary, Preventive Medicine)
- Hand Surgery (multidisciplinary, Surgery)
- Congenital Cardiac Surgery

### Osteopathic Recognition

- Allergy and Immunology
- Cardiovascular Disease
- Diagnostic Radiology
- Emergency Medicine (Three-Year Program)
- Hospice and Palliative Medicine (multidisciplinary, Internal Medicine)
- Neurological Surgery
- Neurology
- Physical Medicine and Rehabilitation
- Plastic Surgery
- Psychiatry
- Pulmonary Disease and Critical Care Medicine
- Sports Medicine (multidisciplinary, Pediatrics)
- Urology
- Internal Medicine - Pediatrics

## FIGURE 1: KEY TO BOX PLOTS

Box plots provide a rigorous and robust way to display complex data, such as for the Milestones. The components of the box plots used for the Milestones are shown below.



As seen in this diagram, the median Milestones level for each resident year is represented by the horizontal line, bounded by the 25th and 75th percentile rank of Milestone ratings, also known as the interquartile range (IQR). The mean rating is represented by the diamond but should be interpreted with caution given the Milestones are ordinal, not interval data. “Min” represents the lowest level and “Max” the highest level (the “whiskers”), excluding outliers (represented by the open circles). As would be expected, there is a general upward trajectory in this subcompetency from Year 1 (median Level 2) to Year 4 (median Level 4).

Most Milestone sets include five levels of development with transition zones between each level (designated as half increments, such as Level 2.5). In this example, the box plot for Resident Year 1 (highlighted by the red box) shows that the median is Level 2, and the IQR extends from Level 1.5 (25th percentile rank) to Level 2.5 (75th percentile rank).

With regard to Milestone levels within an individual residency or fellowship year (i.e., post-graduate year or PGY), the levels can be sorted from least to greatest, and then graphed as shown in this box plot. In the example above, the highest 50 percent of the Resident Year 1 group were at or above Milestone Level 2; they are represented by everything above the median line. Fifty percent of the Year 1 residents fall between Level 1.5 and Level 2.5 (IQR). Those in the top 25 percent of Milestone judgments in the Year 1 group are shown by the top “whisker” (here labeled as “Max”) and the outlier open circles.

The outliers represent those who were judged to be substantially higher (in this case we see two outlier circles) or were judged to be much lower than normal (in this example there are no low outliers). The number of people represented by the circles will vary by the sample size of that specialty.

Box plots provide information on more than just the four split groups. They also show which way the Milestone data can “sway.” For example, if more residents/fellows are judged much higher than just a few residents/fellows being judged much lower, the median is going to be higher, or the top whisker could be longer than the bottom one. Box plots provide a better overview of the data’s distribution nationally than simple means and standard deviations.

The box plots must be interpreted in the context of the Milestones descriptions for each subcompetency within each discipline. Provided below are links to each specialty’s Milestones Sets to help guide review of the data.

## Specialty:

[Allergy and Immunology](#)

[Anesthesiology](#)

[Colon and Rectal Surgery](#)

[Dermatology](#)

[Emergency Medicine](#)

[Family Medicine](#)

[Internal Medicine](#)

[Medical Genetics and Genomics](#)

[Neurological Surgery](#)

[Neurology](#)

[Nuclear Medicine](#)

[Obstetrics and Gynecology](#)

[Ophthalmology](#)

[Orthopaedic Surgery](#)

[Osteopathic Neuromusculoskeletal Medicine](#)

[Otolaryngology – Head and Neck Surgery](#)

[Pathology](#)

[Pediatrics](#)

[Physical Medicine and Rehabilitation](#)

[Plastic Surgery](#)

[Preventive Medicine](#)

(Effective July 2022 Preventive Medicine became three distinct specialties: Aerospace Medicine; Occupational and Environmental Medicine; and Public Health and General Preventive Medicine)

[Psychiatry](#)

[Radiation Oncology](#)

[Radiology](#)

[Surgery](#)

[Thoracic Surgery](#)

[Transitional Year](#)

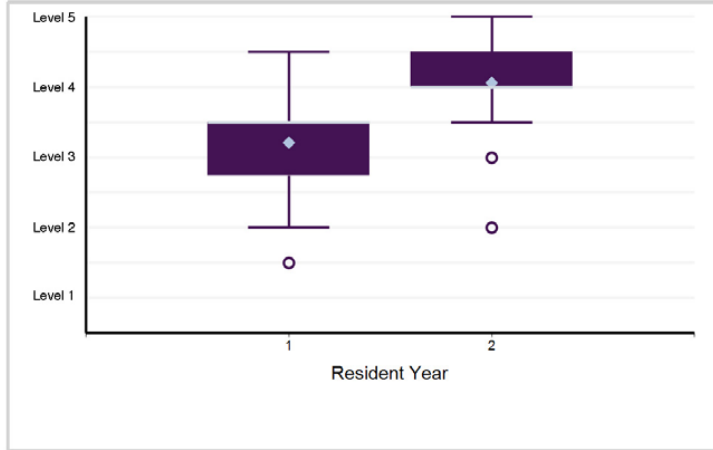
[Urology](#)

# Box Plot Report - Milestone Evaluation by Resident/Fellow Year: Year-End 2022-2023

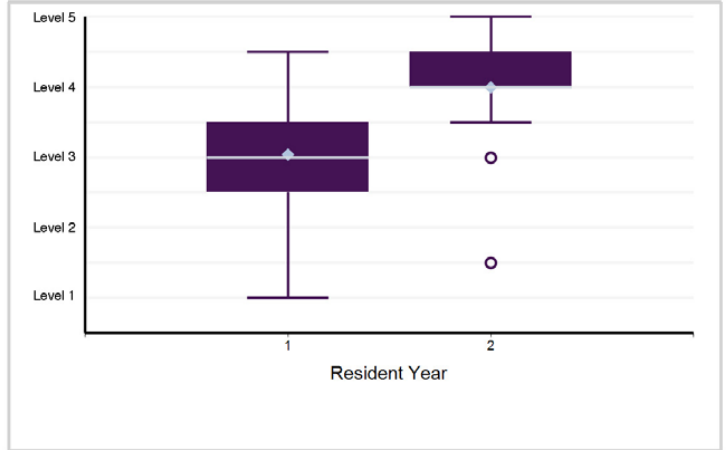
TABLE 50: SPECIALTY: **Medical Genetics and Genomics**

Resident Year	1	2	Total Residents
# of Residents	35	31	66

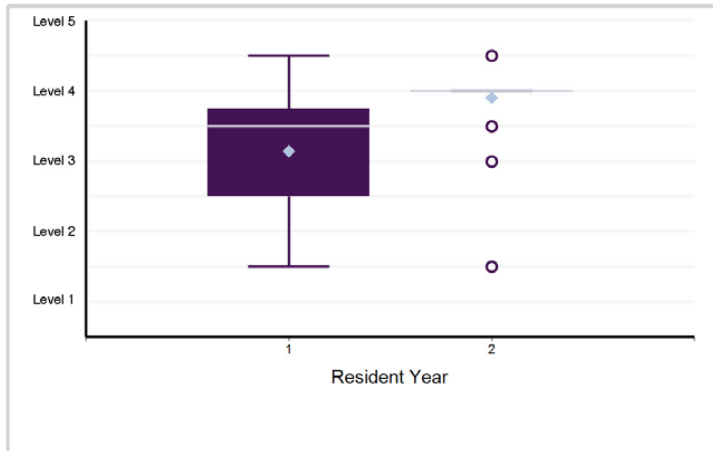
1. Patient Care - Patient Care 1: History and Physical Examination



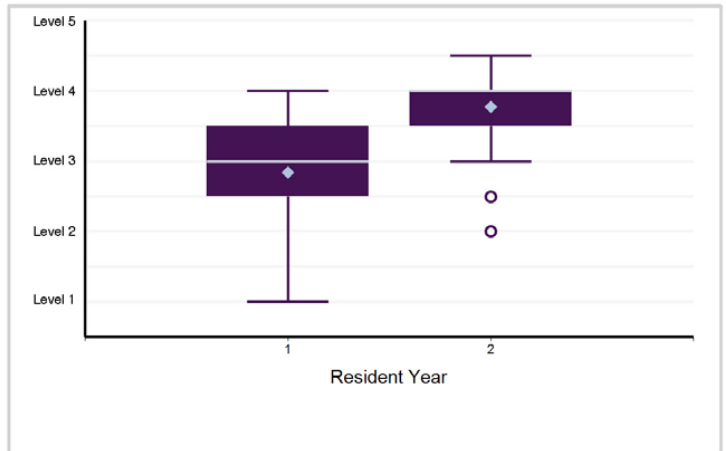
2. Patient Care - Patient Care 2: Selecting Tests, Interpreting Results, and Management of Genetic Conditions



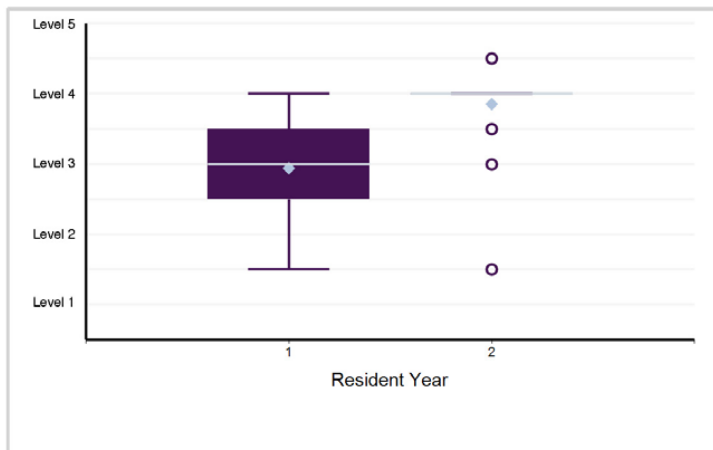
3. Patient Care - Patient Care 3: Pre- and Post-Test Genetic Counseling



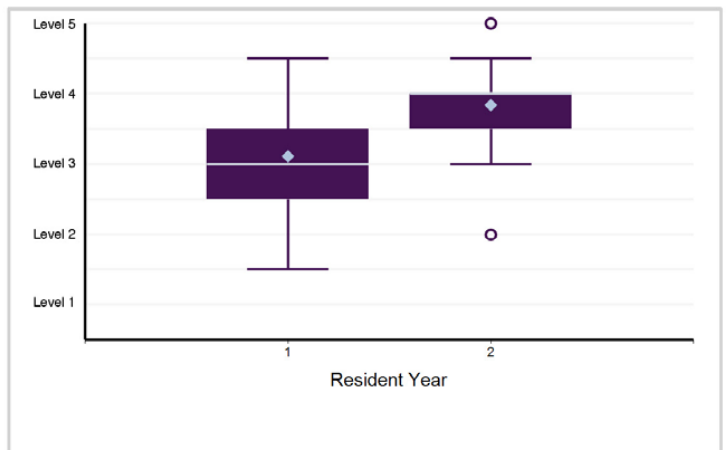
4. Medical Knowledge - Medical Knowledge 1: Foundations of Genetics and Genomics



5. Medical Knowledge - Medical Knowledge 2: Clinical Genetics and Genomics



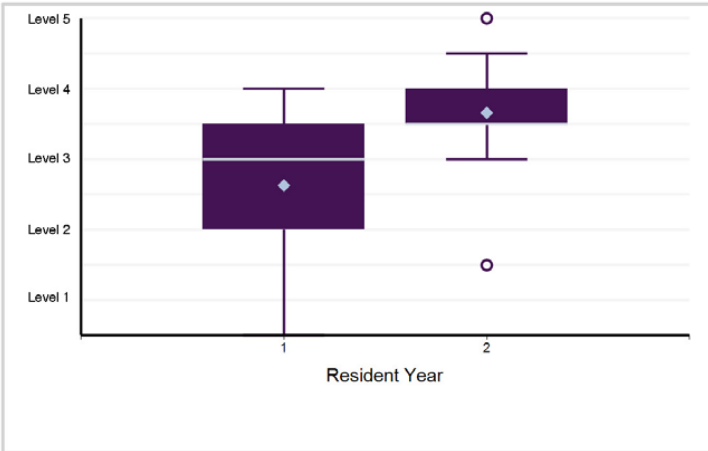
6. Medical Knowledge - Medical Knowledge 3: Clinical Reasoning



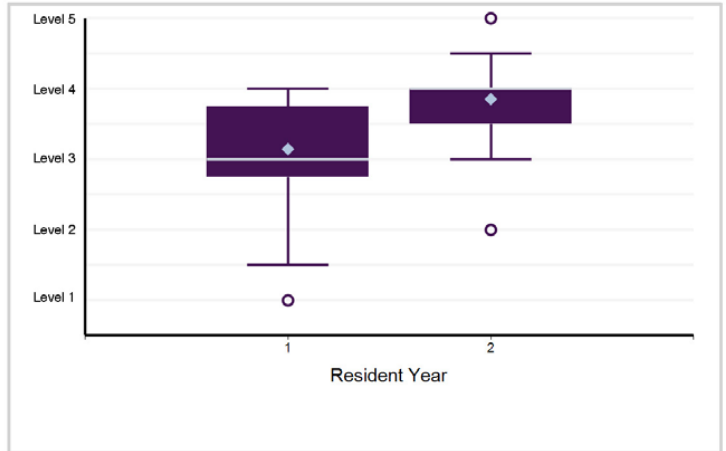
# Box Plot Report - Milestone Evaluation by Resident/Fellow Year: Year-End 2022-2023

## SPECIALTY: Medical Genetics and Genomics

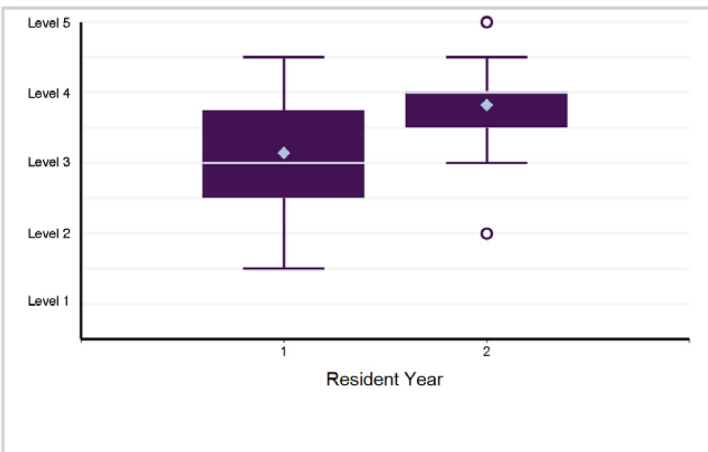
7. Systems-Based Practice - Systems-Based Practice 1: Patient Safety and Quality Improvement



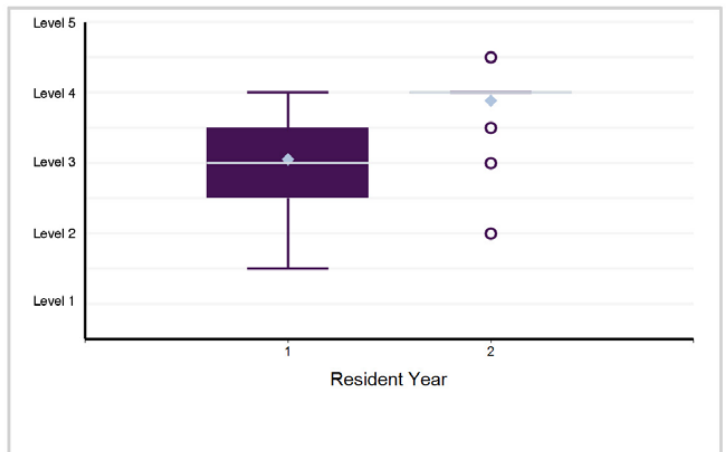
8. Systems-Based Practice - Systems-Based Practice 2: System Navigation for Patient-Centered Care



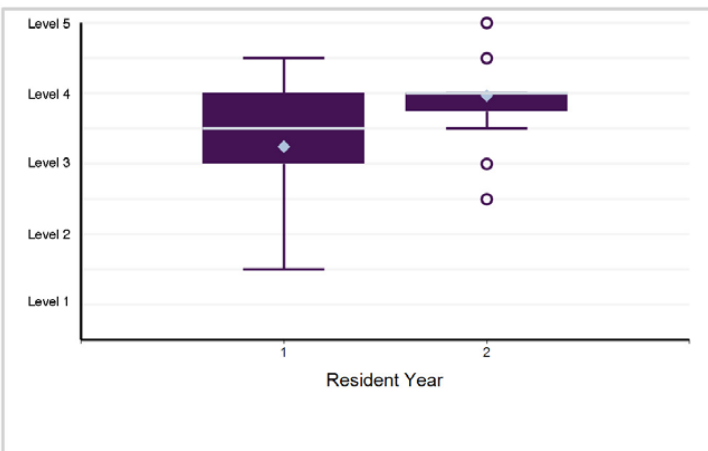
9. Systems-Based Practice - Systems-Based Practice 3: Physician Role in Health Care Systems



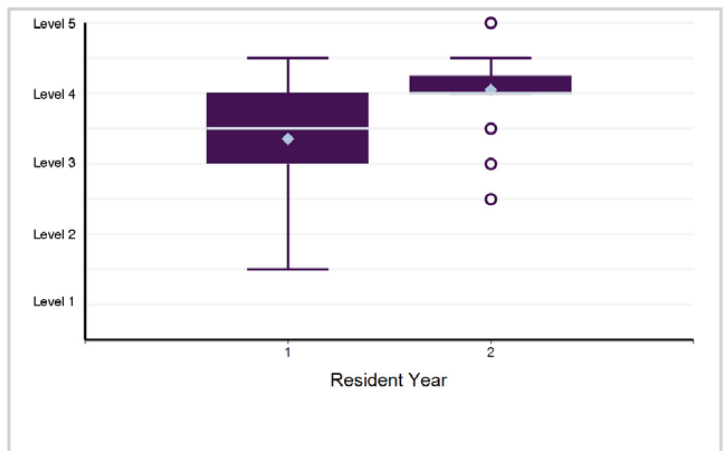
10. Practice-Based Learning and Improvement - Practice-Based Learning and Improvement 1: Evidence-Based and Informed Practice



11. Practice-Based Learning and Improvement - Practice-Based Learning and Improvement 2: Reflective Practice and Commitment ...



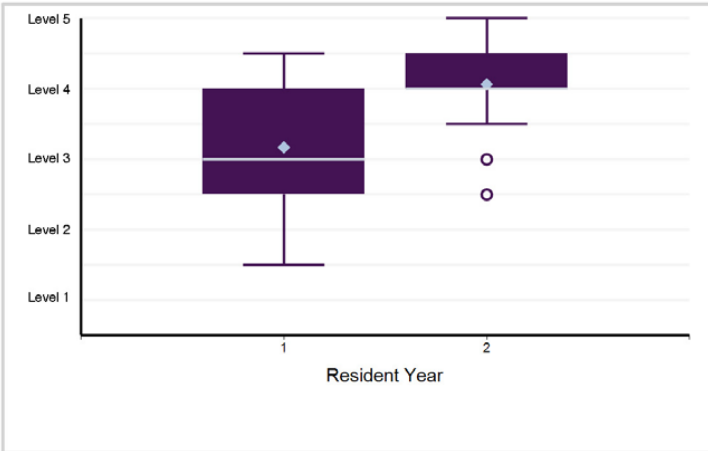
12. Professionalism - Professionalism 1: Professional Behavior and Ethical Principles



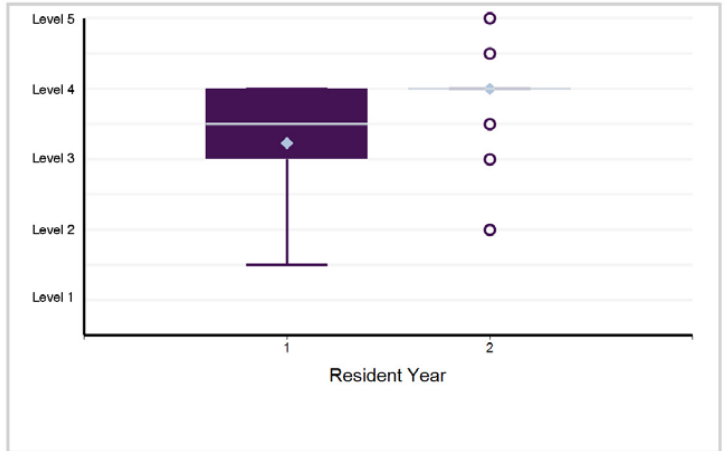
# Box Plot Report - Milestone Evaluation by Resident/Fellow Year: Year-End 2022-2023

## SPECIALTY: Medical Genetics and Genomics

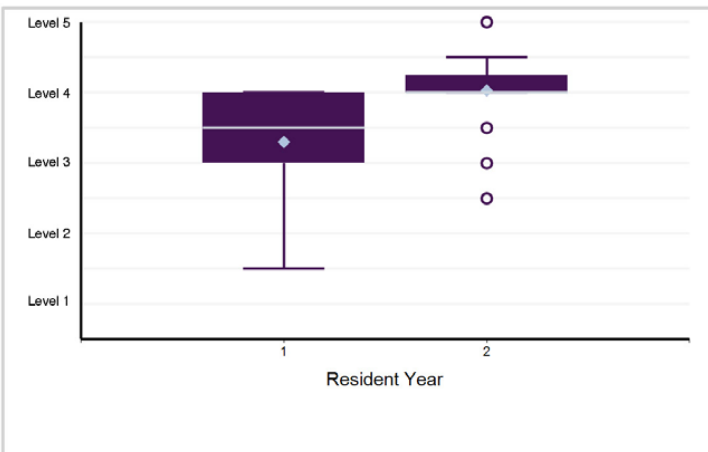
13. Professionalism - Professionalism 2: Accountability/Conscientiousness



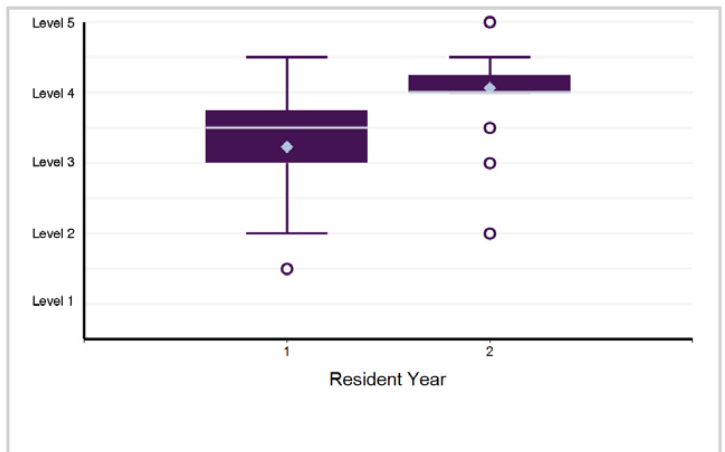
14. Professionalism - Professionalism 3: Self-Awareness and Help-Seeking



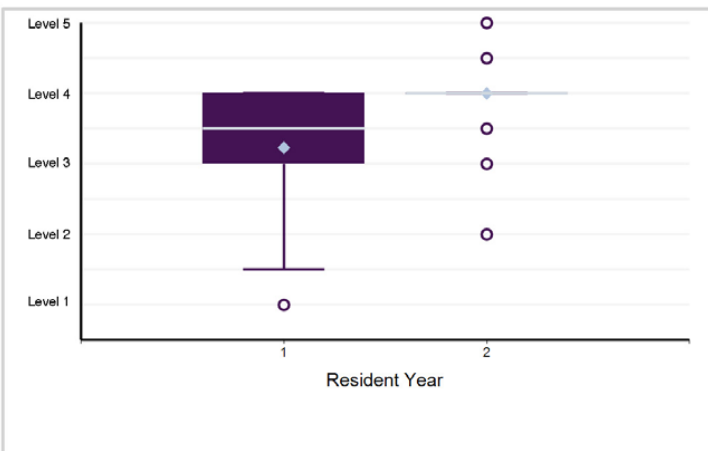
15. Interpersonal and Communication Skills - Interpersonal and Communication Skills 1: Patient and Family-Centered Communication



16. Interpersonal and Communication Skills - Interpersonal and Communication Skills 2: Interprofessional and Team Communication



17. Interpersonal and Communication Skills - Interpersonal and Communication Skills 3: Communication within Health Care Systems

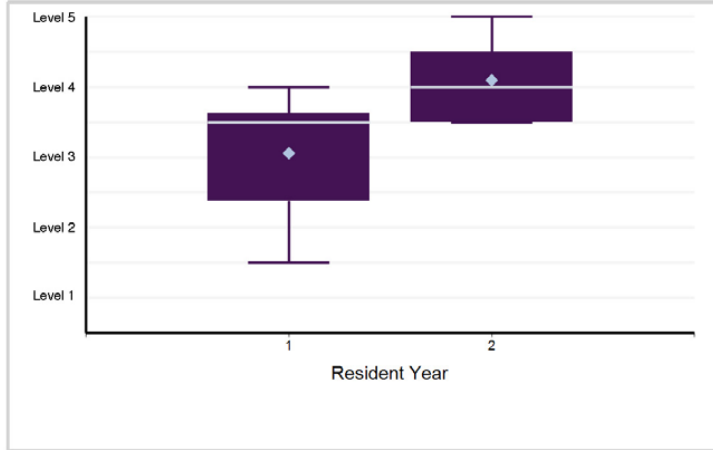


# Box Plot Report - Milestone Evaluation by Resident/Fellow Year: Year-End 2022-2023

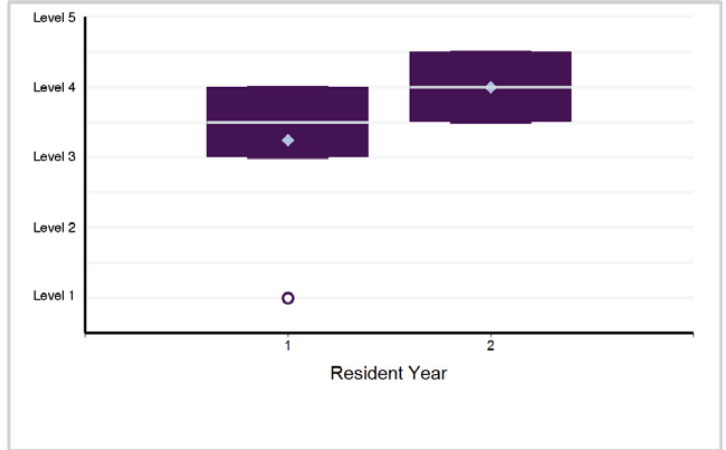
TABLE 51: SUBSPECIALTY: **Clinical Biochemical Genetics**

Fellow Year	1	2	Total Fellows
# of Fellows	8	5	13

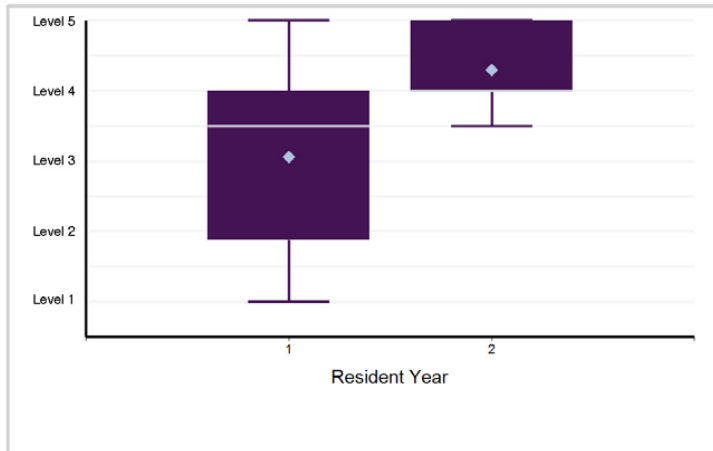
## 1. Patient Care - Patient Care 1: Pre-Analytic



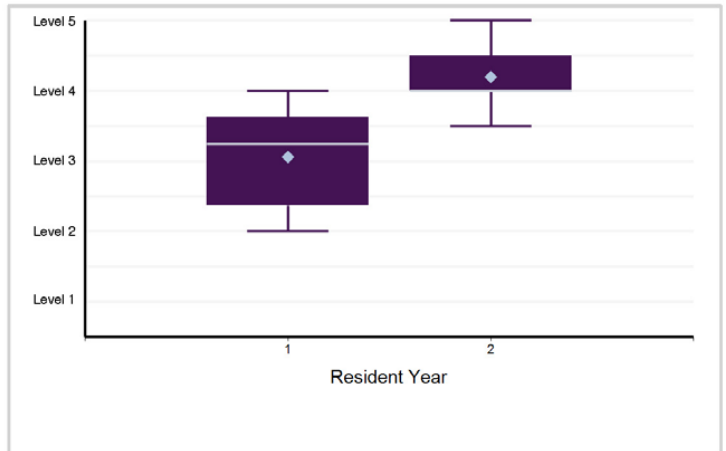
## 2. Patient Care - Patient Care 2: Analytic



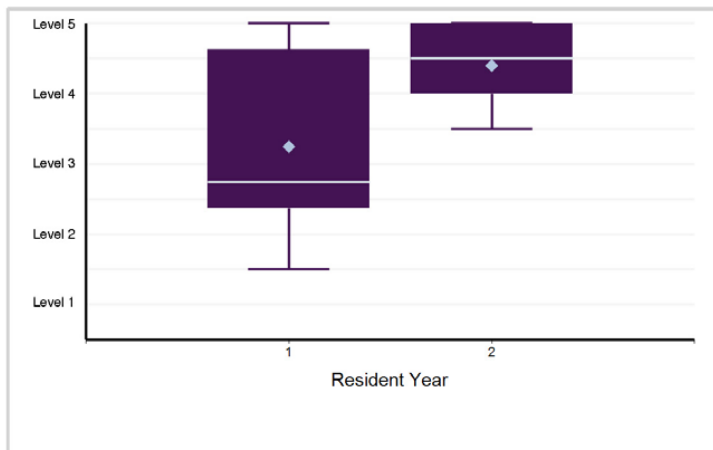
## 3. Patient Care - Patient Care 3: Post-Analytic Skills



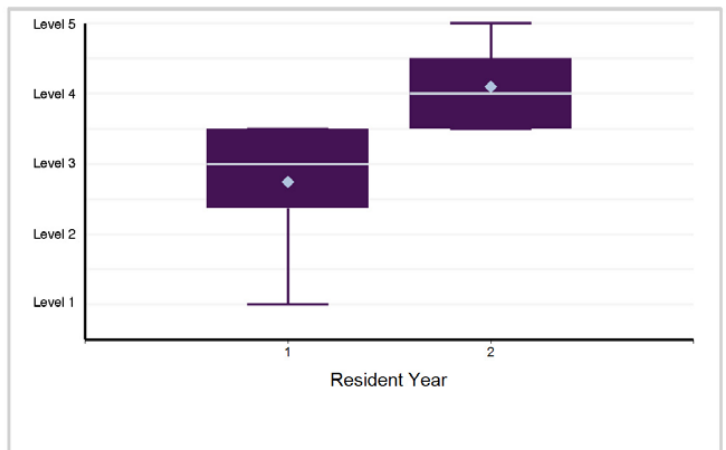
## 4. Patient Care - Patient Care 4: Reports



## 5. Medical Knowledge - Medical Knowledge 1: Foundations of Medical Genetics and Genomics



## 6. Medical Knowledge - Medical Knowledge 2: Testing

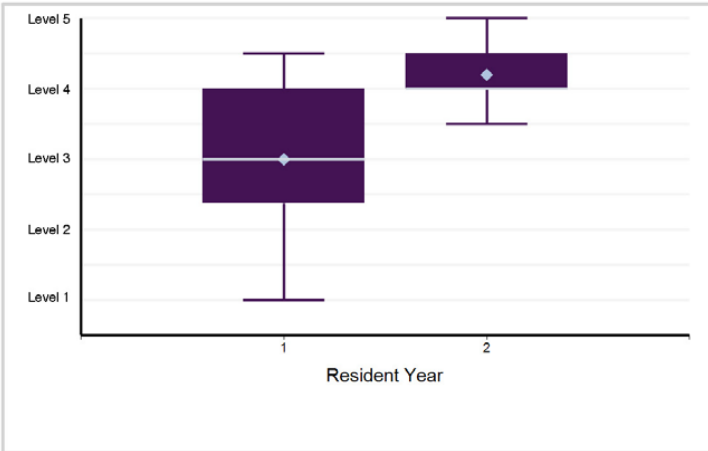




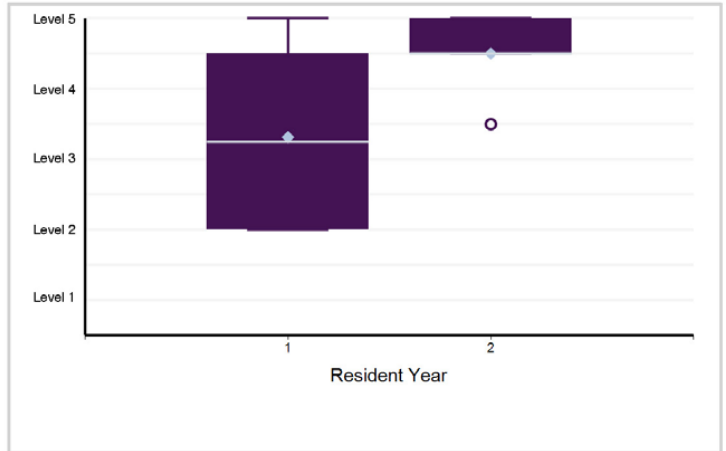
# Box Plot Report - Milestone Evaluation by Resident/Fellow Year: Year-End 2022-2023

## SUBSPECIALTY: Clinical Biochemical Genetics

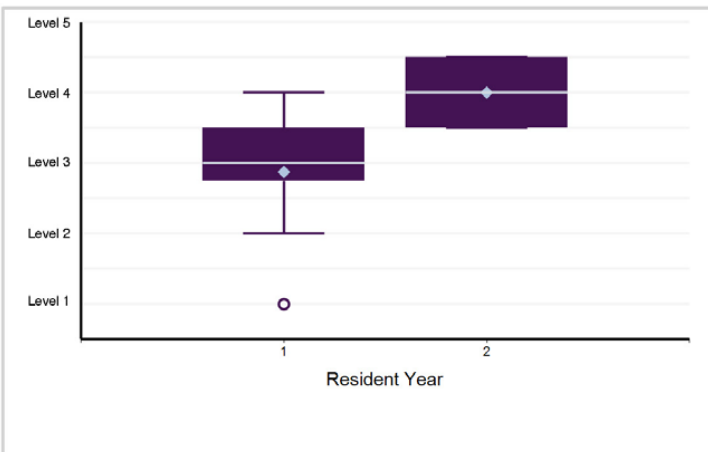
7. Systems-Based Practice - Systems-Based Practice 1: Patient Safety and Quality Improvement (QI)



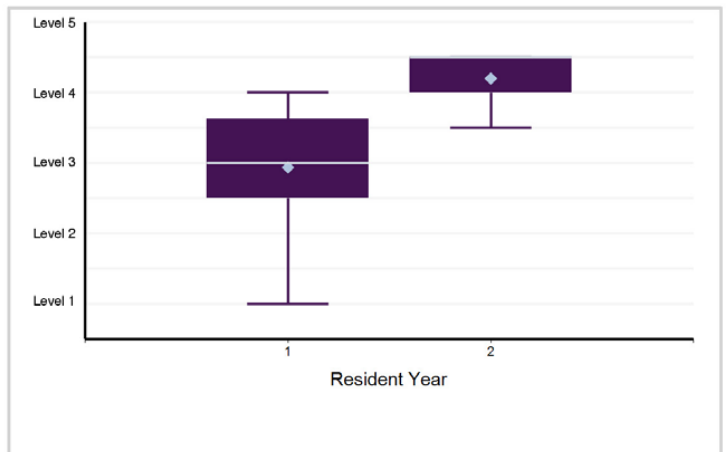
8. Systems-Based Practice - Systems-Based Practice 2: Systems Navigation for Patient-Centered Care



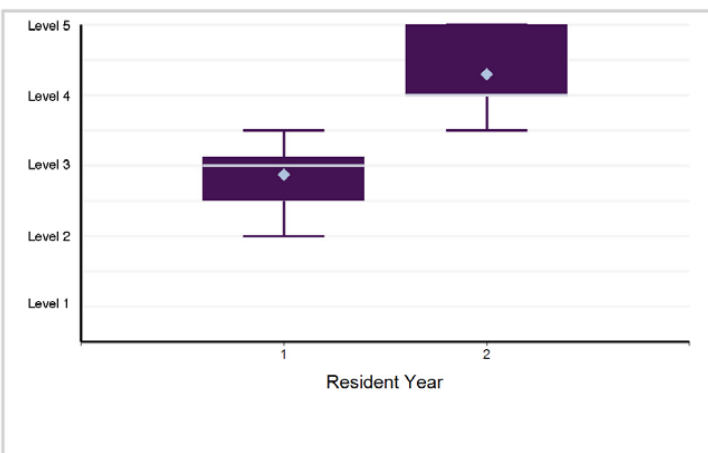
9. Systems-Based Practice - Systems-Based Practice 3: Laboratory Geneticist's Role in Health Care System



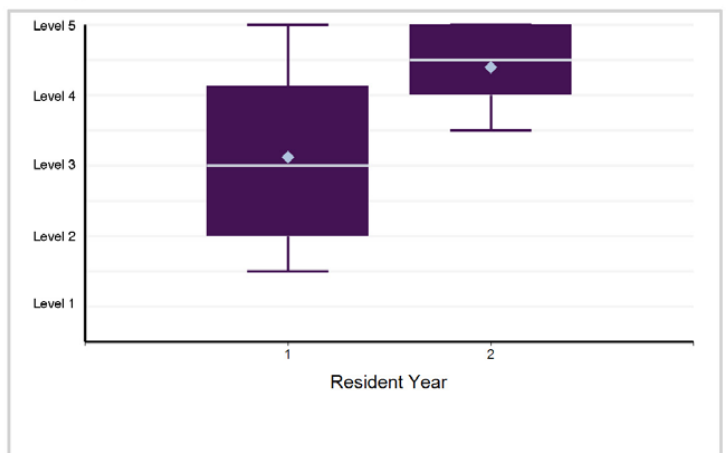
10. Systems-Based Practice - Systems-Based Practice 4: Accreditation, Compliance, and Quality Management



11. Systems-Based Practice - Systems-Based Practice 5: Informatics



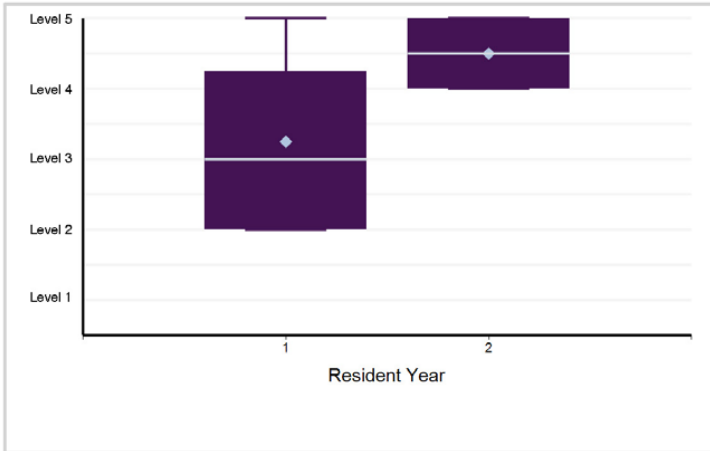
12. Practice-Based Learning and Improvement - Practice-Based Learning and Improvement 1: Evidence-Based Practice



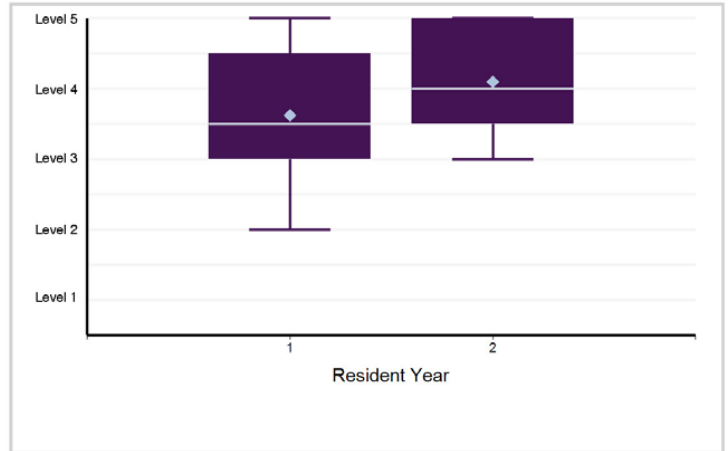
# Box Plot Report - Milestone Evaluation by Resident/Fellow Year: Year-End 2022-2023

## SUBSPECIALTY: Clinical Biochemical Genetics

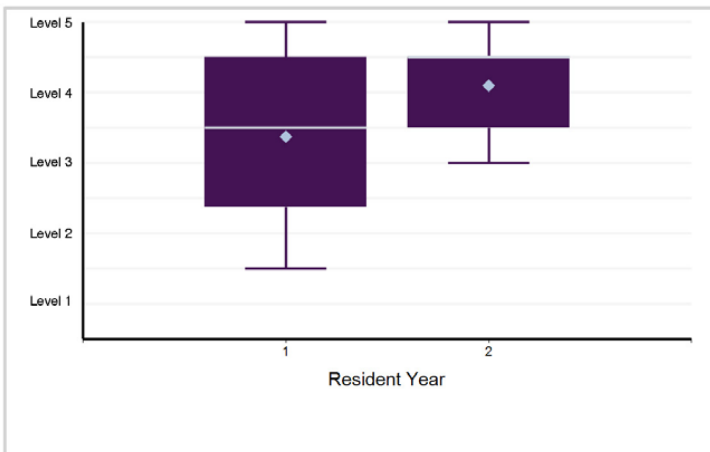
13. Practice-Based Learning and Improvement - Practice-Based Learning and Improvement 2: Reflective Practice and Commitment ...



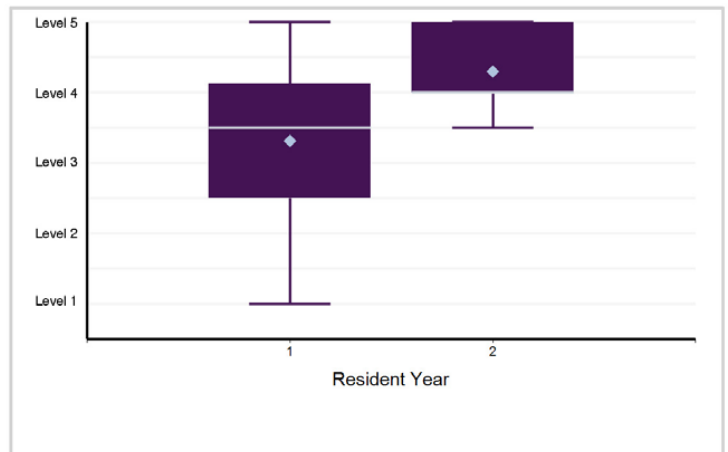
14. Professionalism - Professionalism 1: Professional Behavior and Ethical Principles



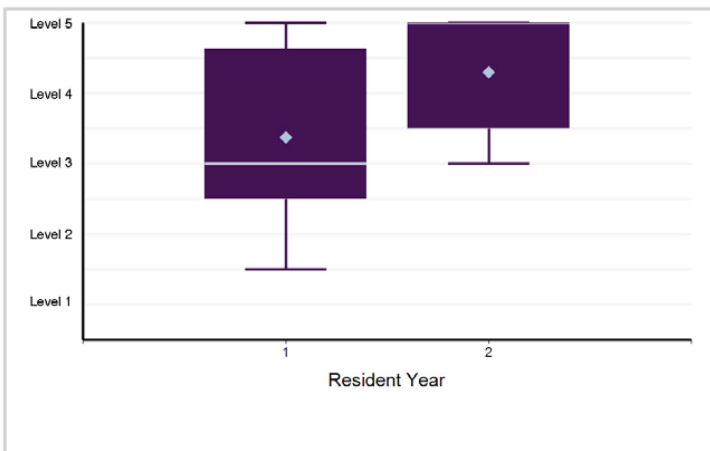
15. Professionalism - Professionalism 2: Accountability and Conscientiousness



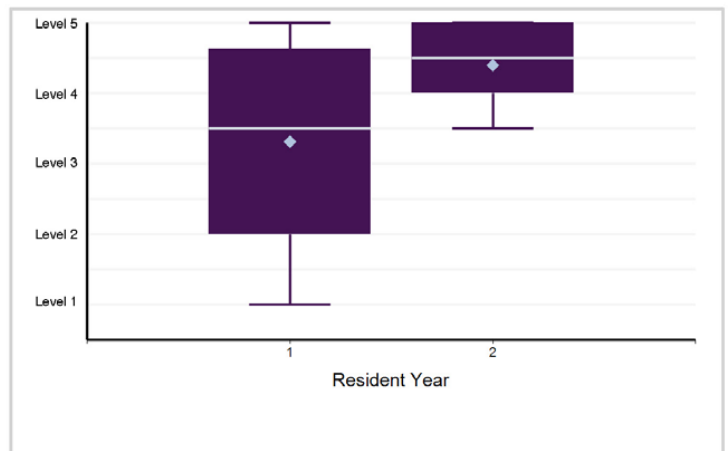
16. Professionalism - Professionalism 3: Personal and Professional Well-Being



17. Interpersonal and Communication Skills - Interpersonal and Communication Skills 1: Patient- and Family-Centered Communication



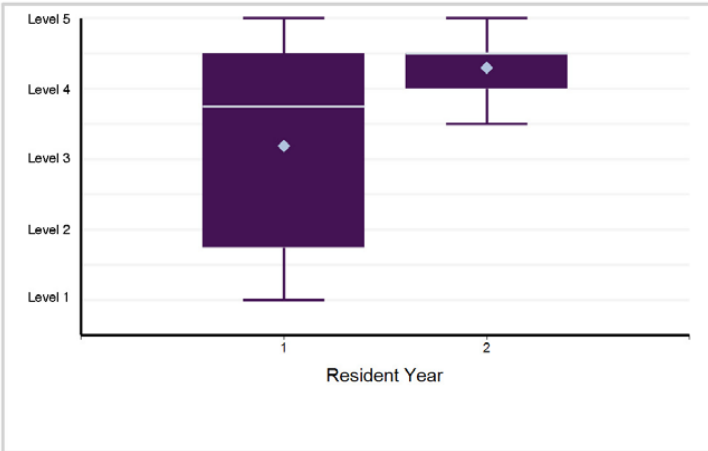
18. Interpersonal and Communication Skills - Interpersonal and Communication Skills 2: Interprofessional and Team Communication



# Box Plot Report - Milestone Evaluation by Resident/Fellow Year: Year-End 2022-2023

## SUBSPECIALTY: Clinical Biochemical Genetics

19. Interpersonal and Communication Skills - Interpersonal and Communication Skills 3: Communication within Health Care Systems

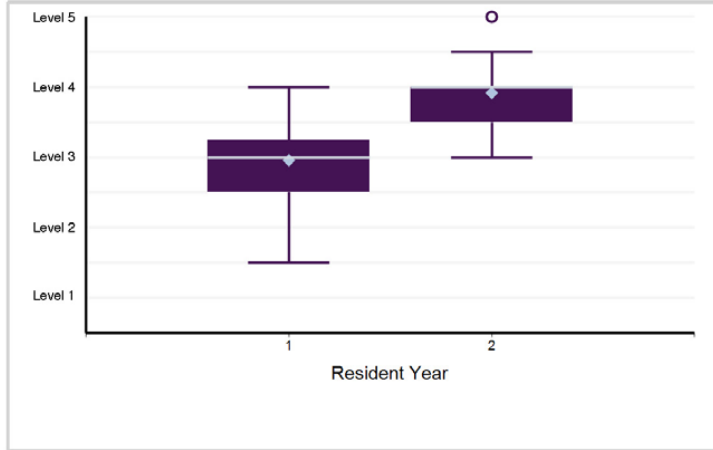


# Box Plot Report - Milestone Evaluation by Resident/Fellow Year: Year-End 2022-2023

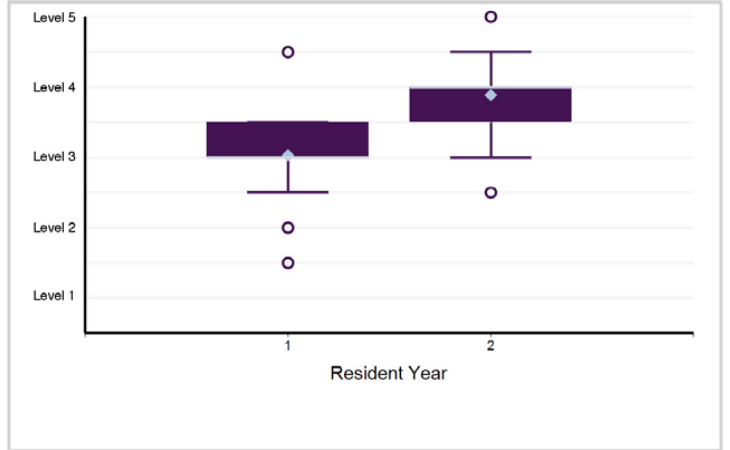
TABLE 52: SUBSPECIALTY: **Laboratory Genetics and Genomics**

Fellow Year	1	2	Total Fellows
# of Fellows	43	32	75

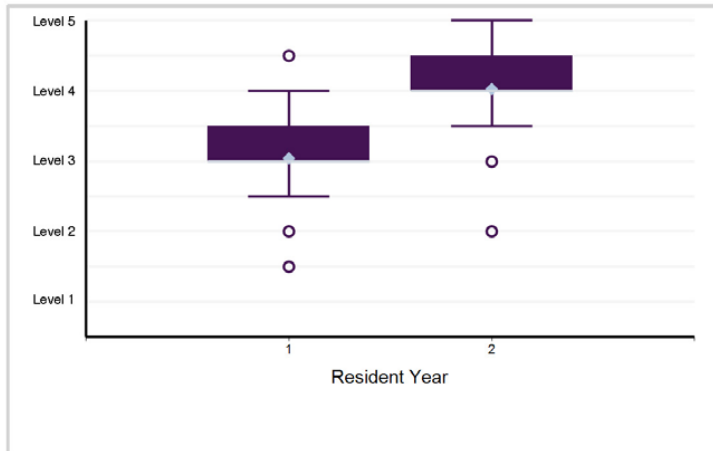
1. Patient Care - Patient Care 1: Pre-Analytic



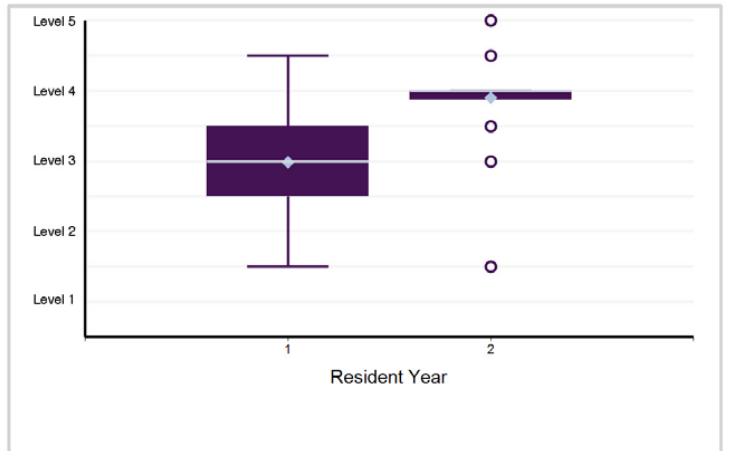
2. Patient Care - Patient Care 2: Analytic



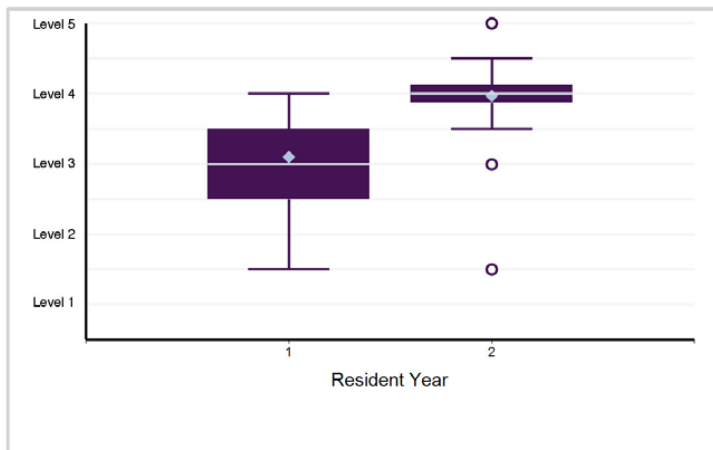
3. Patient Care - Patient Care 3: Post-Analytic Skills



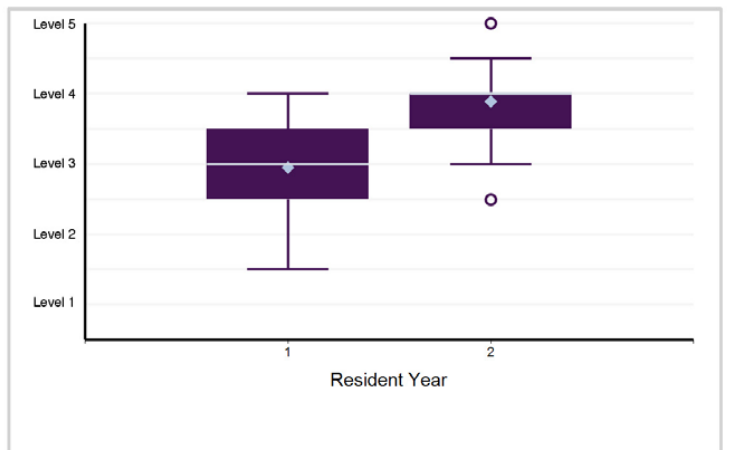
4. Patient Care - Patient Care 4: Reports



5. Medical Knowledge - Medical Knowledge 1: Foundations of Medical Genetics and Genomics



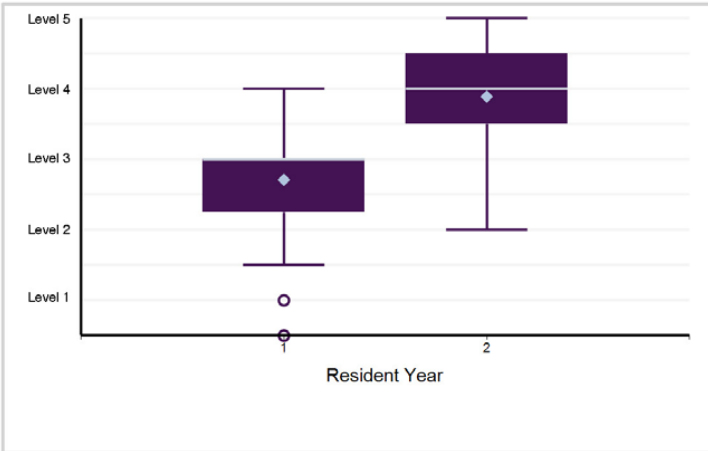
6. Medical Knowledge - Medical Knowledge 2: Testing



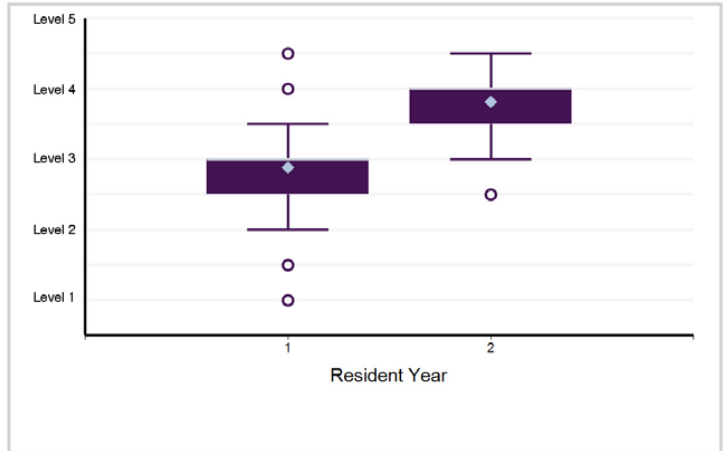
# Box Plot Report - Milestone Evaluation by Resident/Fellow Year: Year-End 2022-2023

## SUBSPECIALTY: Laboratory Genetics and Genomics

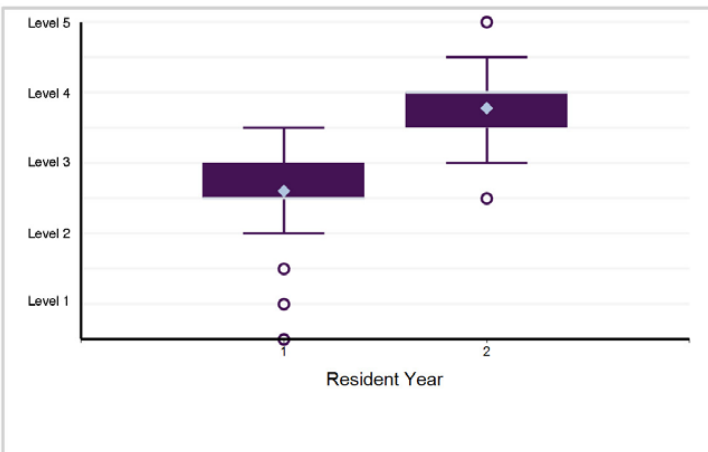
7. Systems-Based Practice - Systems-Based Practice 1: Patient Safety and Quality Improvement (QI)



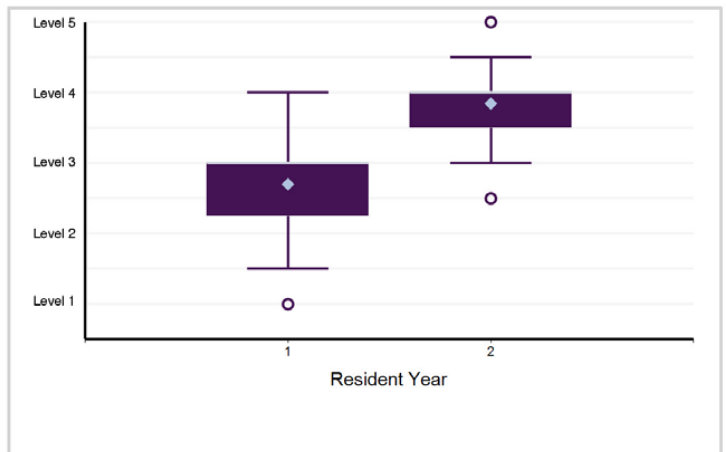
8. Systems-Based Practice - Systems-Based Practice 2: Systems Navigation for Patient-Centered Care



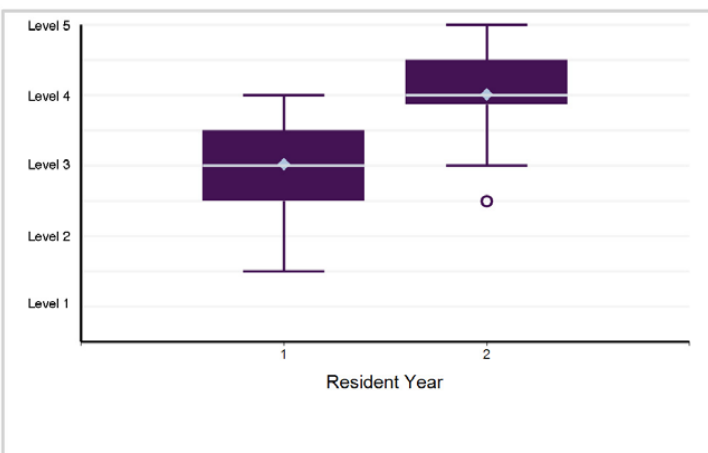
9. Systems-Based Practice - Systems-Based Practice 3: Laboratory Geneticist's Role in Health Care System



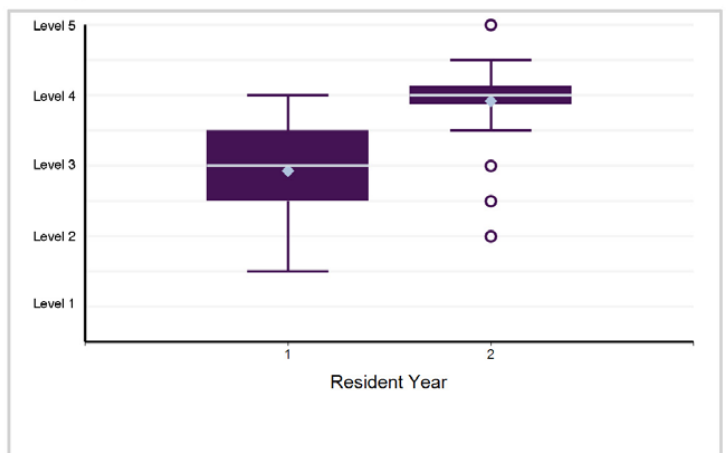
10. Systems-Based Practice - Systems-Based Practice 4: Accreditation, Compliance, and Quality Management



11. Systems-Based Practice - Systems-Based Practice 5: Informatics



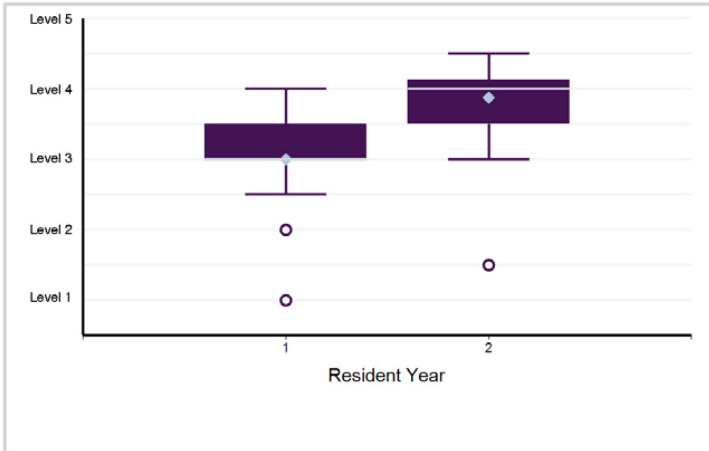
12. Practice-Based Learning and Improvement - Practice-Based Learning and Improvement 1: Evidence-Based Practice



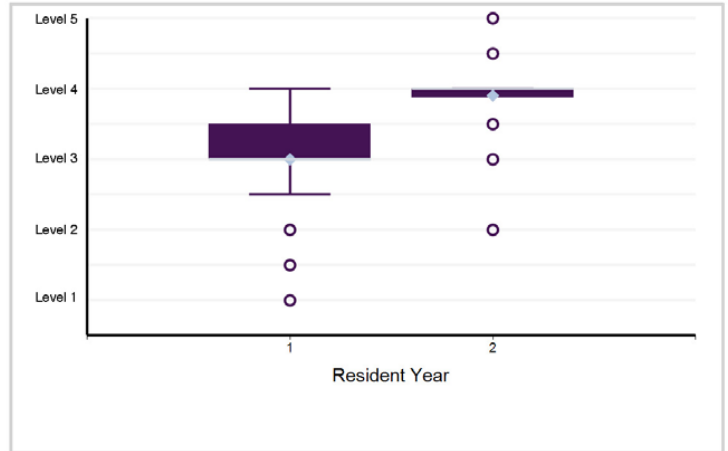
# Box Plot Report - Milestone Evaluation by Resident/Fellow Year: Year-End 2022-2023

## SUBSPECIALTY: Laboratory Genetics and Genomics

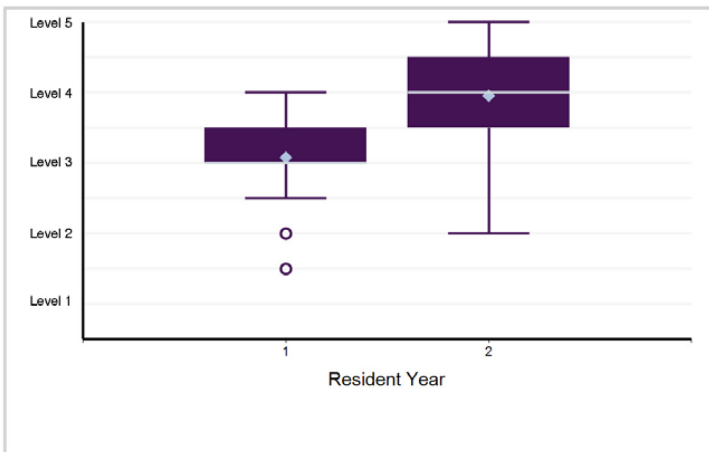
13. Practice-Based Learning and Improvement - Practice-Based Learning and Improvement 2: Reflective Practice and Commitment ...



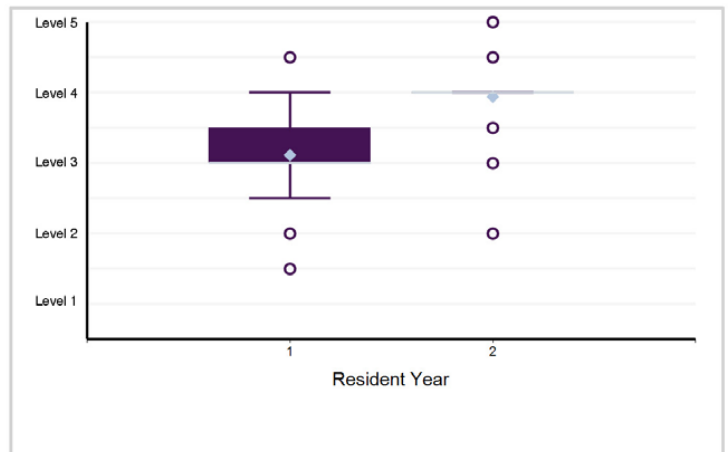
14. Professionalism - Professionalism 1: Professional Behavior and Ethical Principles



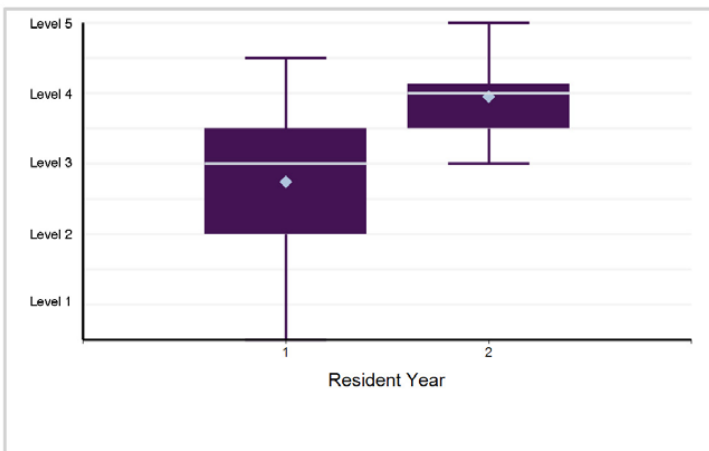
15. Professionalism - Professionalism 2: Accountability and Conscientiousness



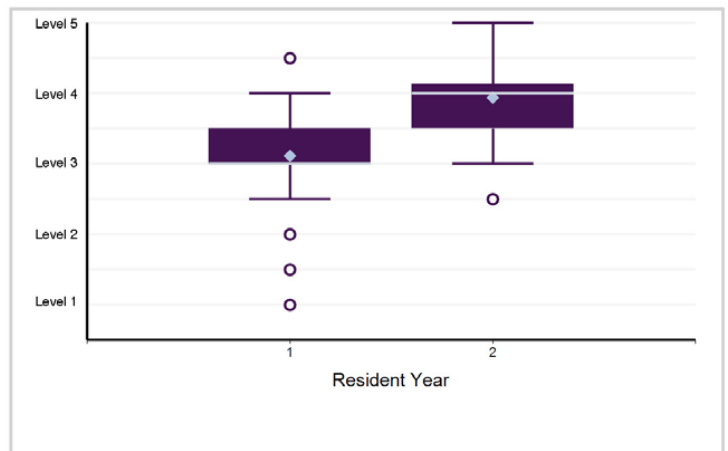
16. Professionalism - Professionalism 3: Personal and Professional Well-Being



17. Interpersonal and Communication Skills - Interpersonal and Communication Skills 1: Patient and Family-Centered Communication



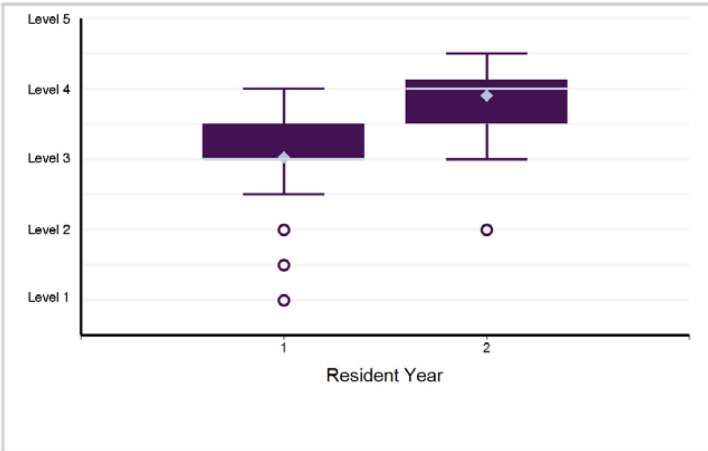
18. Interpersonal and Communication Skills - Interpersonal and Communication Skills 2: Interprofessional and Team Communication



# Box Plot Report - Milestone Evaluation by Resident/Fellow Year: Year-End 2022-2023

## SUBSPECIALTY: Laboratory Genetics and Genomics

19. Interpersonal and Communication Skills - Interpersonal and Communication Skills 3: Communication within Health Care Systems

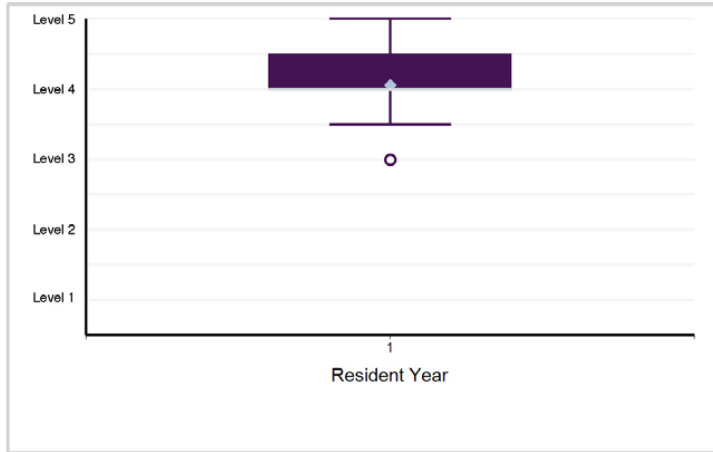


# Box Plot Report - Milestone Evaluation by Resident/Fellow Year: Year-End 2022-2023

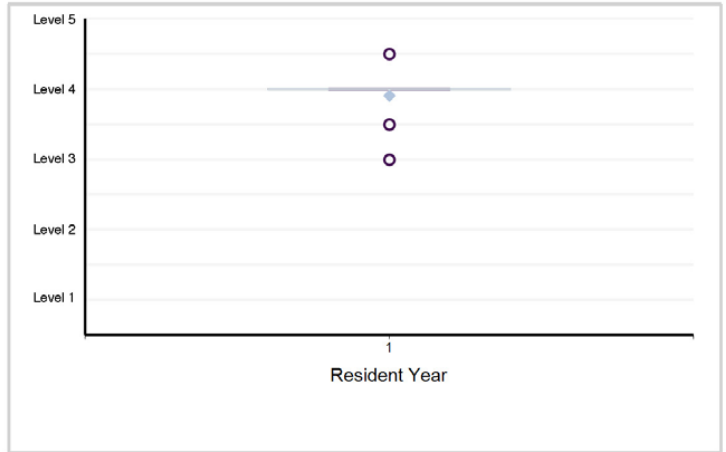
TABLE 53: SUBSPECIALTY: **Medical Biochemical Genetics**

Fellow Year	1	Total Fellows
# of Fellows	17	17

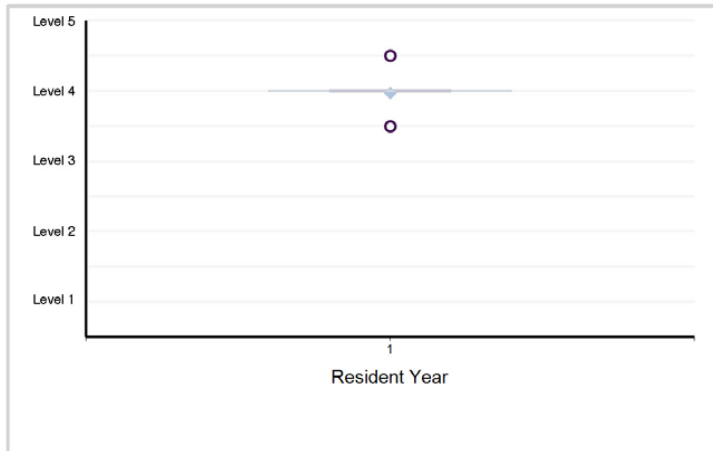
1. Patient Care - Patient Care 1: Initial or Acute Management



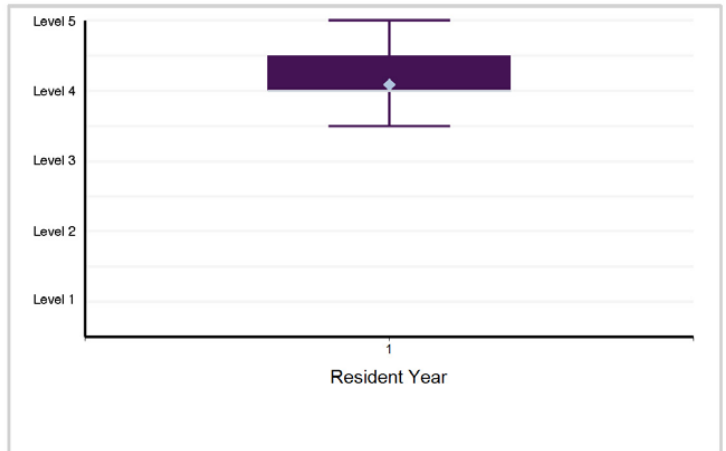
2. Patient Care - Patient Care 2: Chronic Management



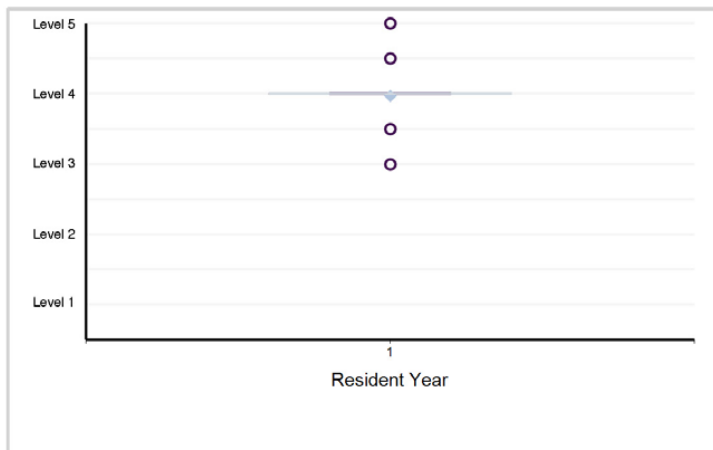
3. Patient Care - Patient Care 3: Newborn Screening



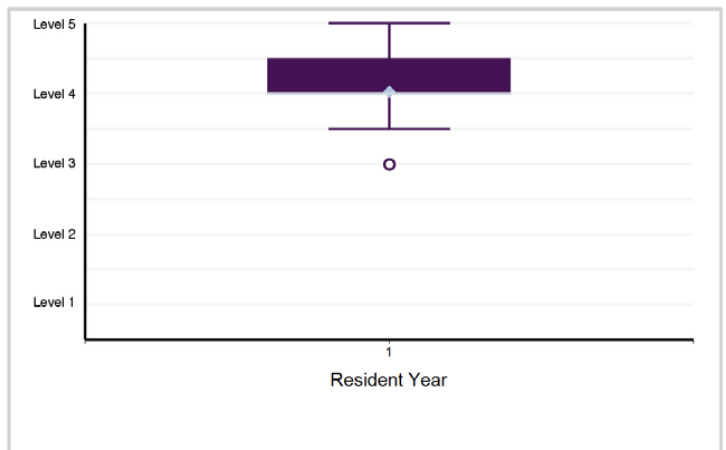
4. Medical Knowledge - Medical Knowledge 1: Molecular and Metabolic Mechanisms



5. Medical Knowledge - Medical Knowledge 2: Diagnostic Testing



6. Systems-Based Practice - Systems-Based Practice 1: Patient Safety and Quality Improvement

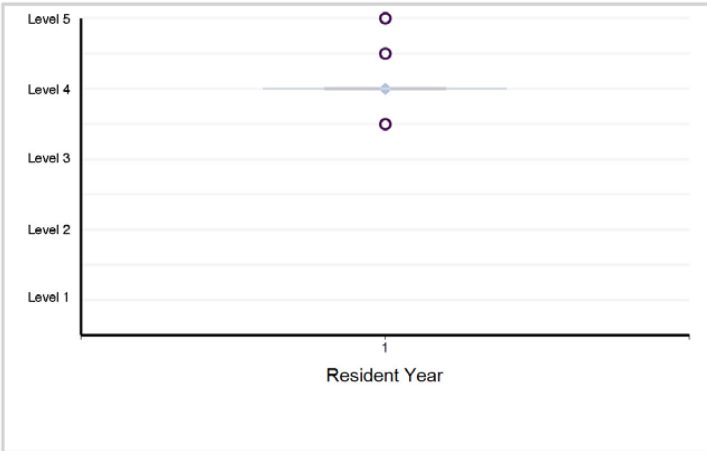




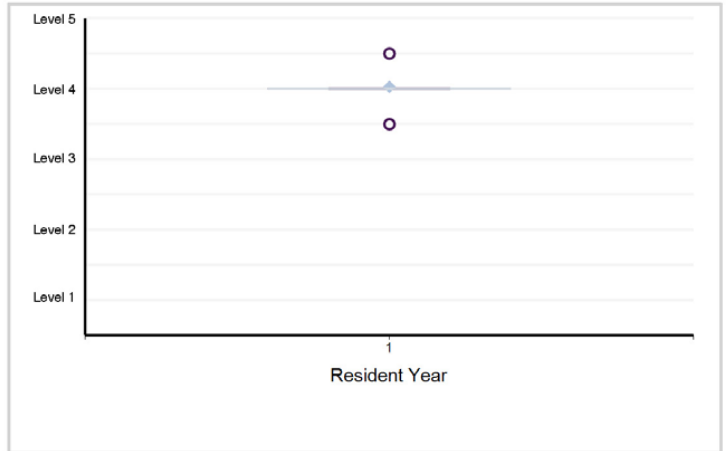
# Box Plot Report - Milestone Evaluation by Resident/Fellow Year: Year-End 2022-2023

## SUBSPECIALTY: Medical Biochemical Genetics

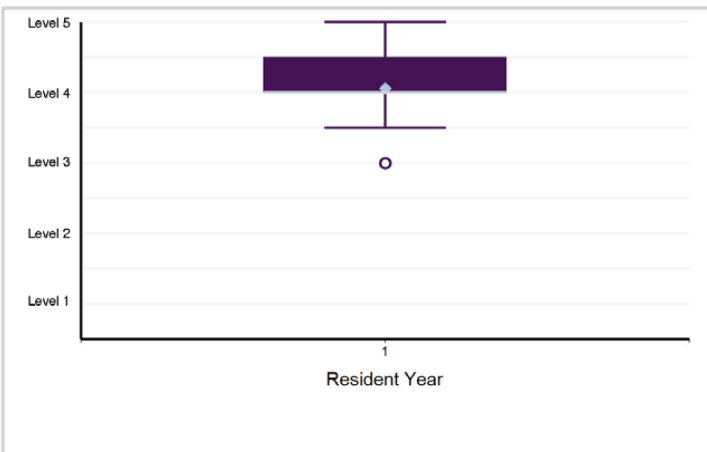
7. Systems-Based Practice - Systems-Based Practice 2: System Navigation for Patient-Centered Care



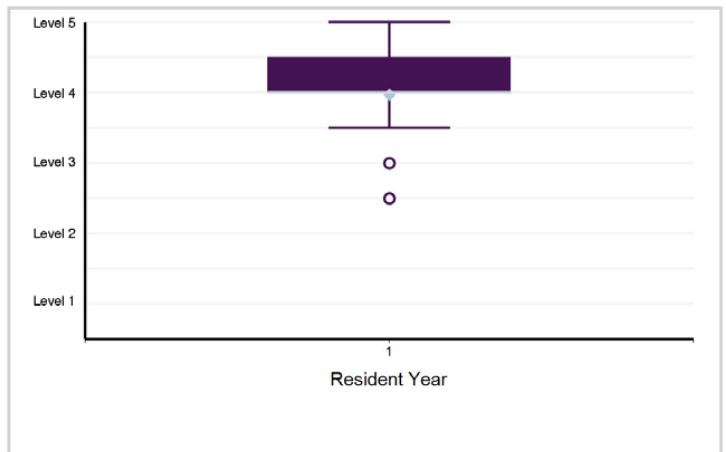
8. Systems-Based Practice - Systems-Based Practice 3: Physician Role in Health Care Systems



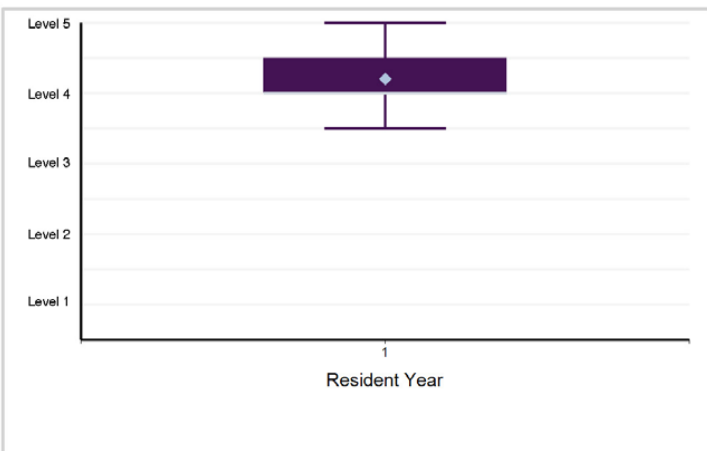
9. Practice-Based Learning and Improvement - Practice-Based Learning and Improvement 1: Evidence-Based and Informed Practice



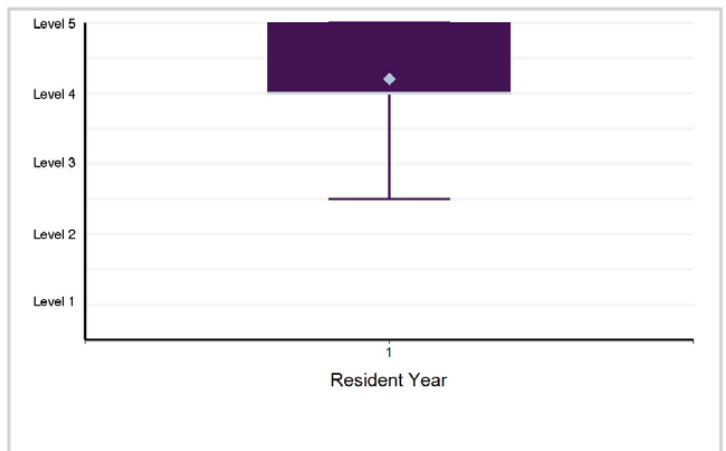
10. Practice-Based Learning and Improvement - Practice-Based Learning and Improvement 2: Reflective Practice and Commitment ...



11. Professionalism - Professionalism 1: Professional Behavior and Ethical Principles



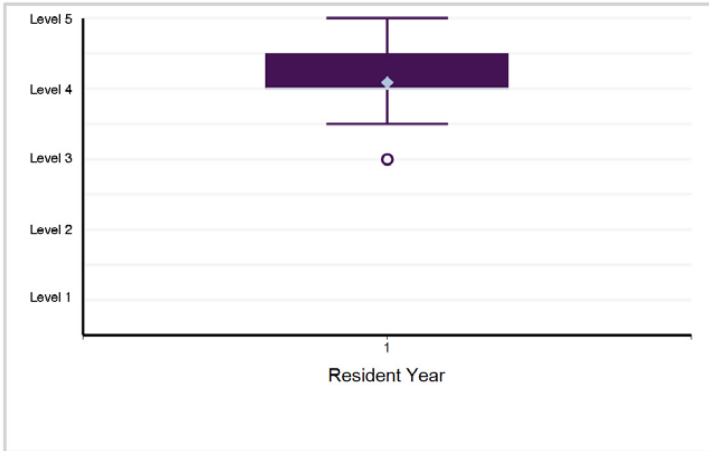
12. Professionalism - Professionalism 2: Accountability/Conscientiousness



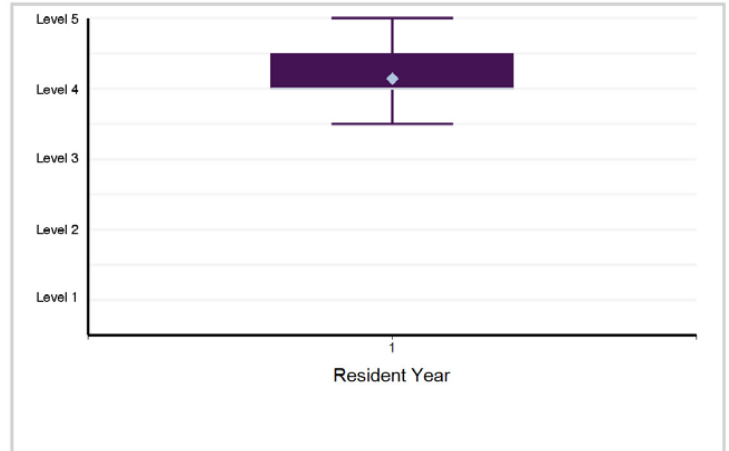
# Box Plot Report - Milestone Evaluation by Resident/Fellow Year: Year-End 2022-2023

## SUBSPECIALTY: Medical Biochemical Genetics

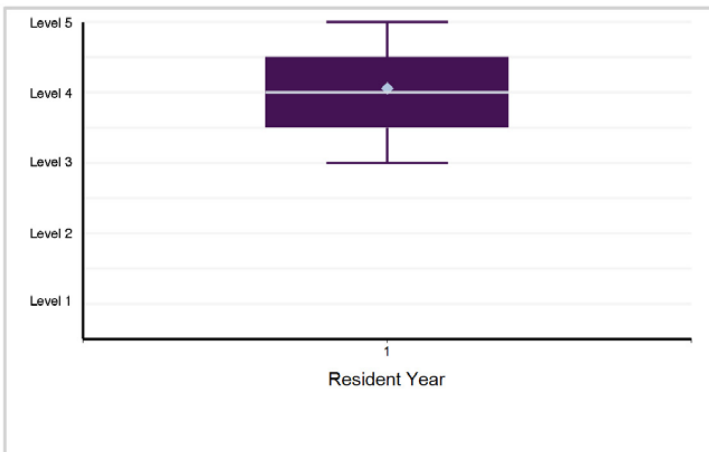
13. Professionalism - Professionalism 3: Self-Awareness and Help-Seeking



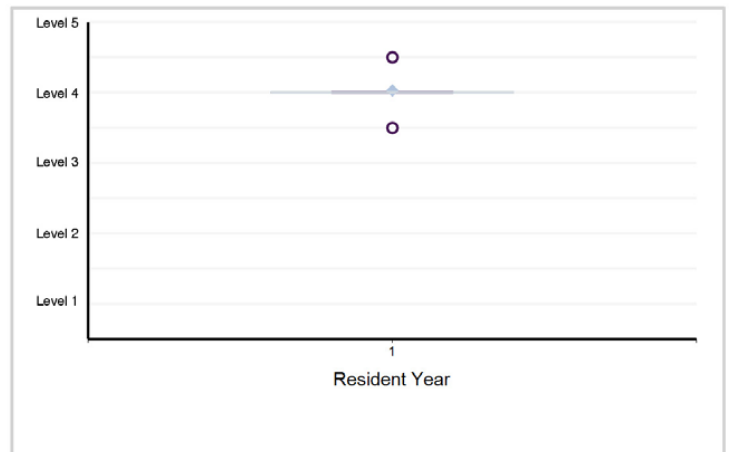
14. Interpersonal and Communication Skills - Interpersonal and Communication Skills 1: Patient and Family-Centered Communication



15. Interpersonal and Communication Skills - Interpersonal and Communication Skills 2: Interprofessional and Team Communication



16. Interpersonal and Communication Skills - Interpersonal and Communication Skills 3: Communication within Health Care Systems

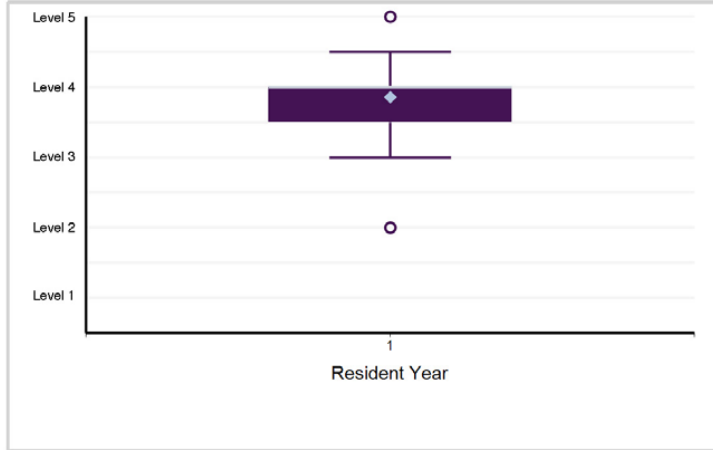


# Box Plot Report - Milestone Evaluation by Resident/Fellow Year: Year-End 2022-2023

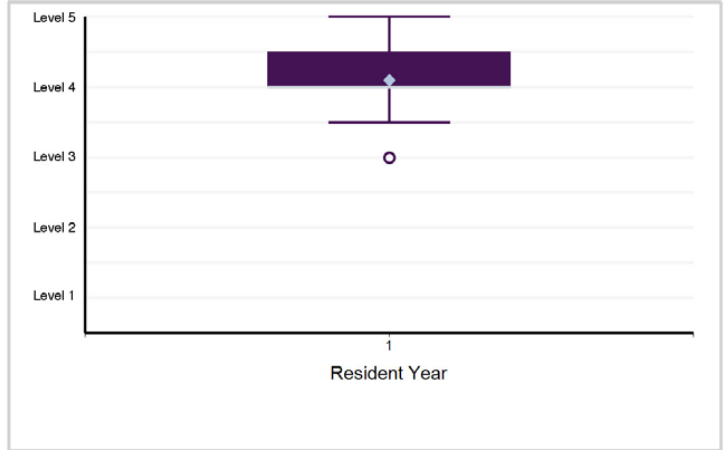
TABLE 54: SUBSPECIALTY: **Molecular Genetic Pathology (multidisciplinary)**

Fellow Year	1	Total Fellows
# of Fellows	60	60

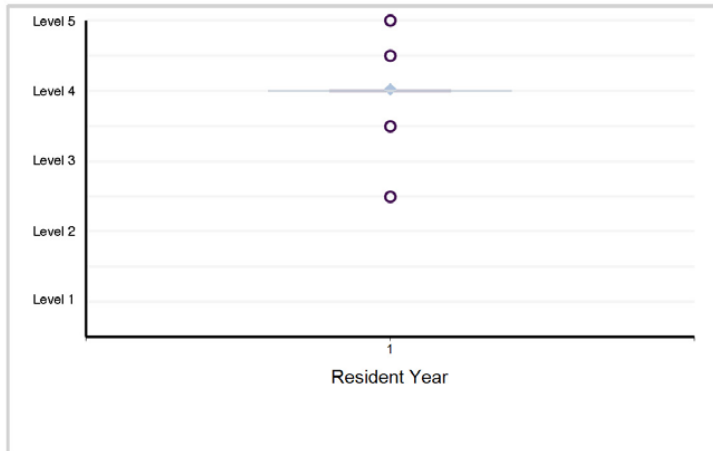
1. Patient Care - Patient Care 1: Quality Assurance and Quality Management



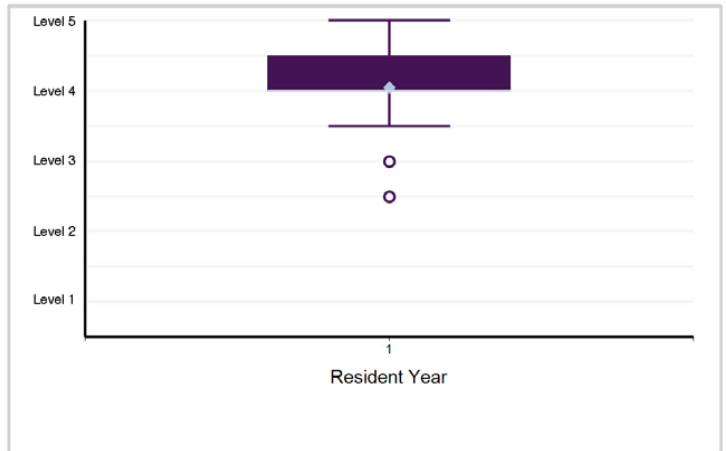
2. Patient Care - Patient Care 2: Interpretation of Molecular and Genetic Testing



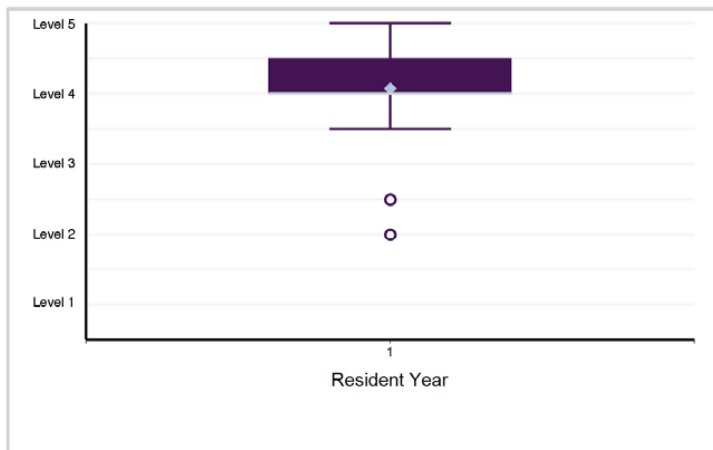
3. Patient Care - Patient Care 3: Interdisciplinary Consultation



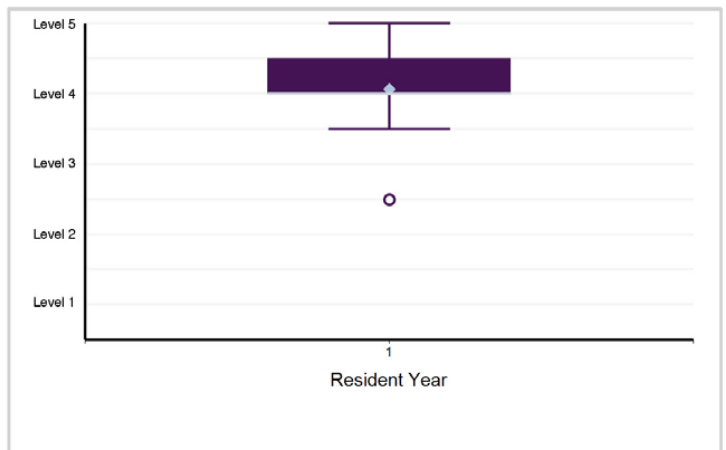
4. Medical Knowledge - Medical Knowledge 1: Molecular Testing with Various Platforms (Diagnosis, Management, Prognostication)



5. Medical Knowledge - Medical Knowledge 2: Genomic Testing, Genomic Databases, and Bioinformatics



6. Medical Knowledge - Medical Knowledge 3: Patient-Centered Interpretation



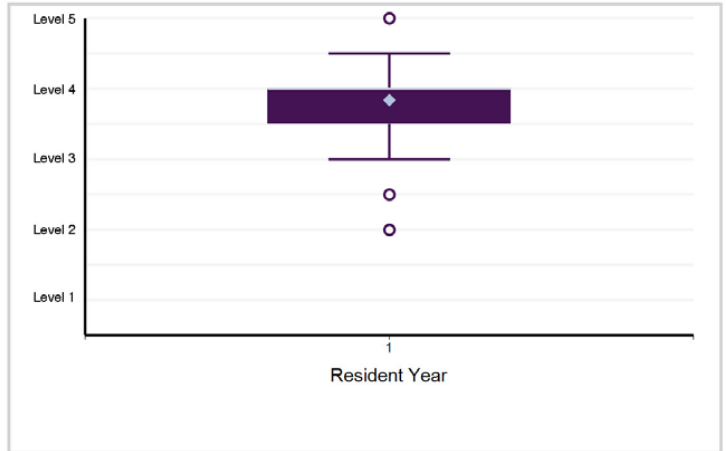
# Box Plot Report - Milestone Evaluation by Resident/Fellow Year: Year-End 2022-2023

## SUBSPECIALTY: Molecular Genetic Pathology (multidisciplinary)

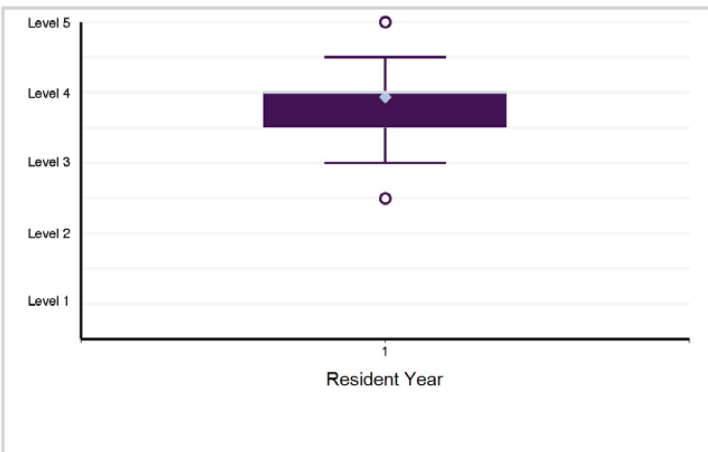
7. Medical Knowledge - Medical Knowledge 4: Assay Design and Verification/Validation (e.g., Wet Labs, Troubleshooting)



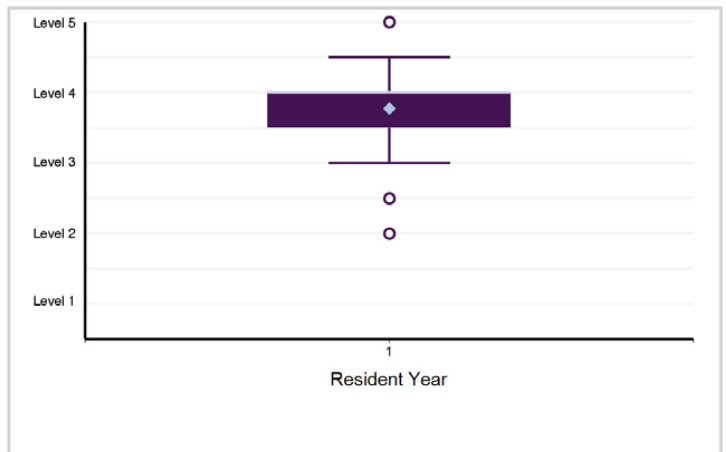
8. Systems-Based Practice - Systems-Based Practice 1: Patient Safety and Quality Improvement (QI)



9. Systems-Based Practice - Systems-Based Practice 2: Systems Navigation for Patient-Centered Care



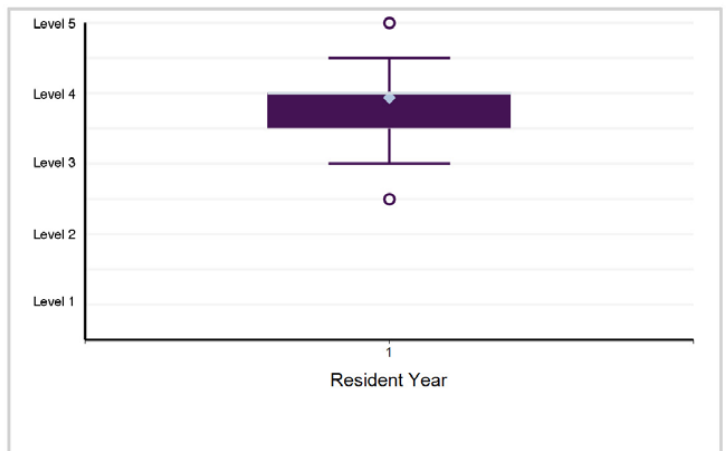
10. Systems-Based Practice - Systems-Based Practice 3: Community Health



11. Systems-Based Practice - Systems-Based Practice 4: Physician Role in Health Care System



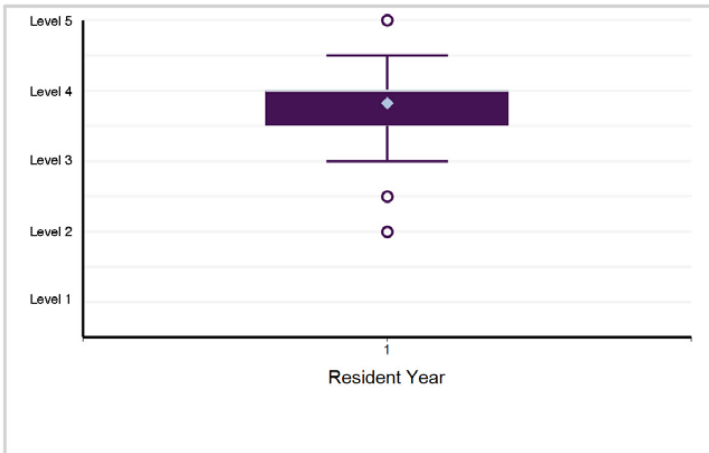
12. Systems-Based Practice - Systems-Based Practice 5: Accreditation, Compliance, and Quality



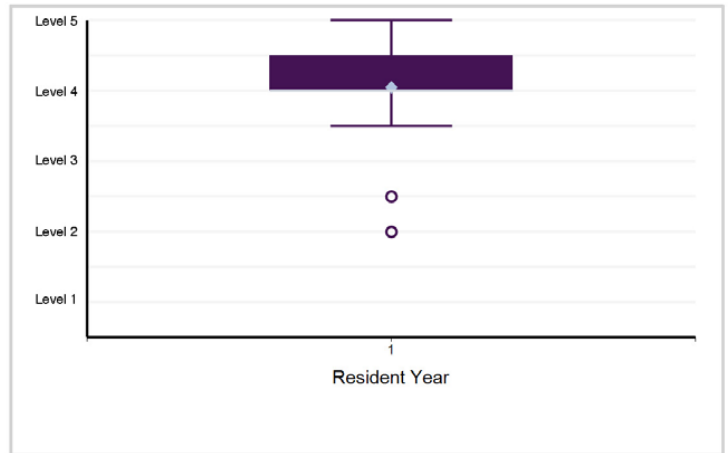
# Box Plot Report - Milestone Evaluation by Resident/Fellow Year: Year-End 2022-2023

## SUBSPECIALTY: Molecular Genetic Pathology (multidisciplinary)

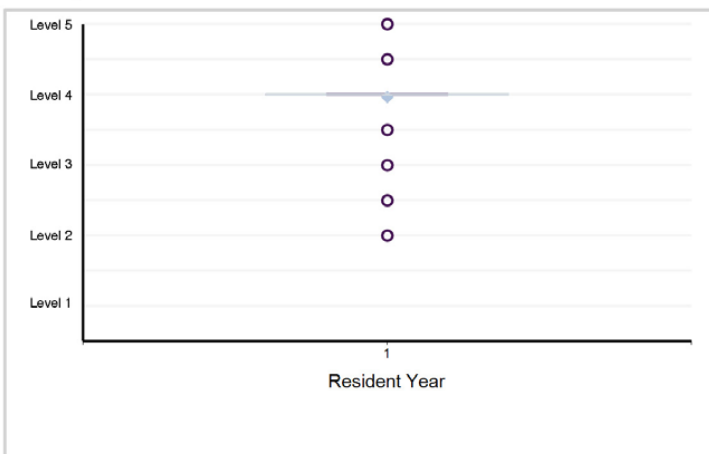
13. Systems-Based Practice - Systems-Based Practice 6: Utilization



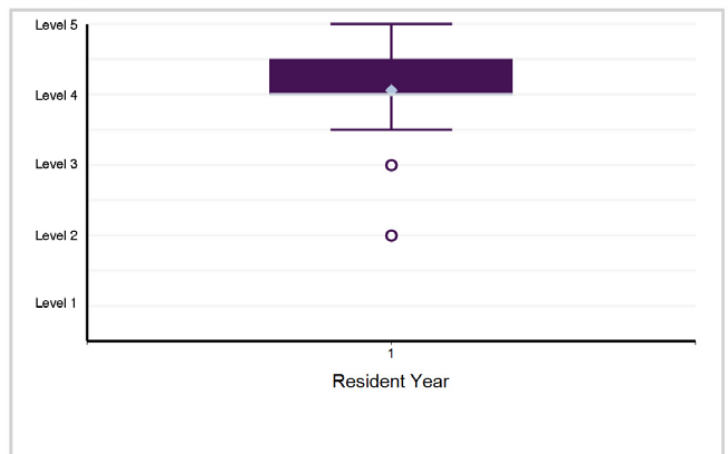
14. Practice-Based Learning and Improvement - Practice-Based Learning and Improvement 1: Evidence-Based Practice and Scholarship



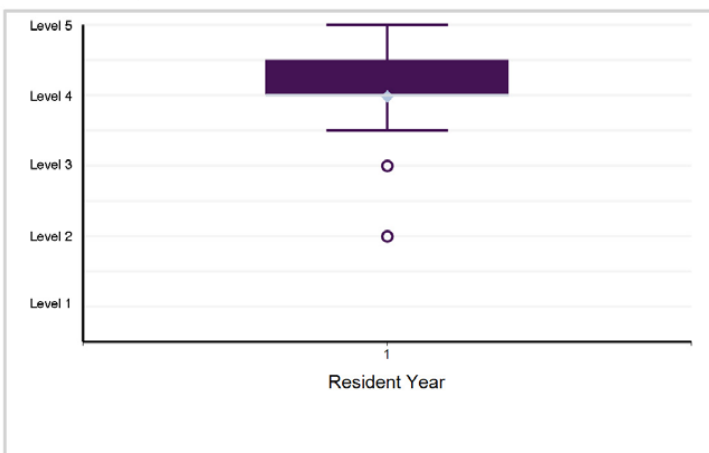
15. Practice-Based Learning and Improvement - Practice-Based Learning and Improvement 2: Research



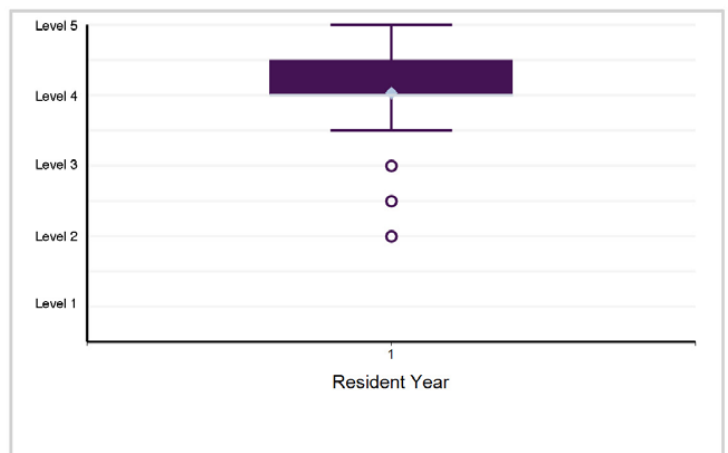
16. Practice-Based Learning and Improvement - Practice-Based Learning and Improvement 3: Reflective Practice and Commitment ...



17. Professionalism - Professionalism 1: Professional Behavior and Ethical Principles



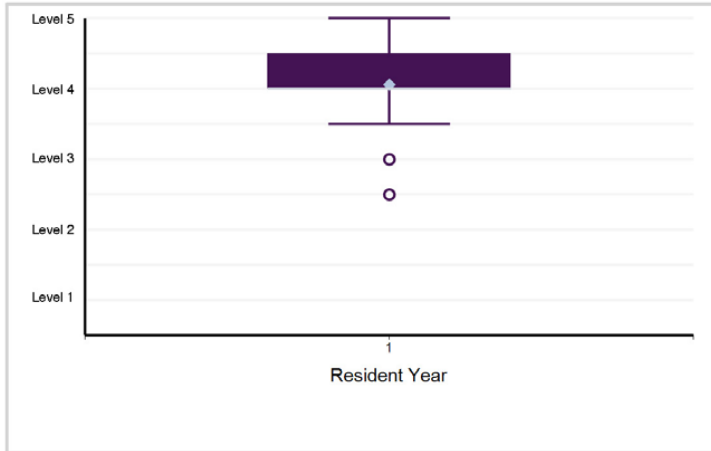
18. Professionalism - Professionalism 2: Accountability and Conscientiousness



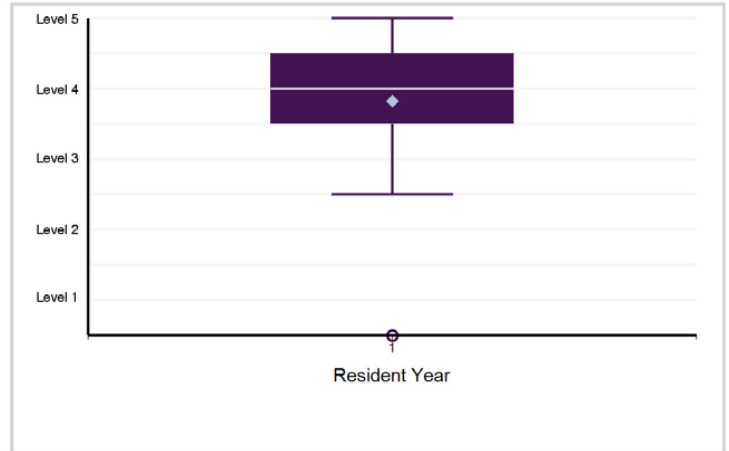
# Box Plot Report - Milestone Evaluation by Resident/Fellow Year: Year-End 2022-2023

## SUBSPECIALTY: Molecular Genetic Pathology (multidisciplinary)

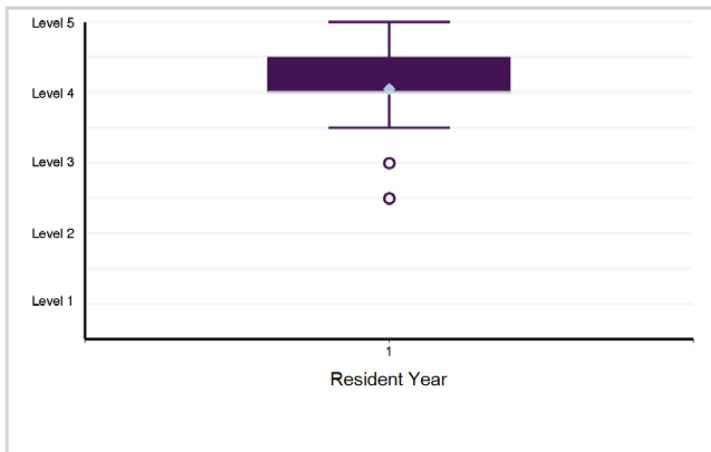
19. Professionalism - Professionalism 3: Self-Awareness and Help-Seeking



20. Interpersonal and Communication Skills - Interpersonal and Communication Skills 1: Patient- and Family-Centered Communication



21. Interpersonal and Communication Skills - Interpersonal and Communication Skills 2: Interprofessional and Team Communication



22. Interpersonal and Communication Skills - Interpersonal and Communication Skills 3: Communication within Health Care Systems

