

Average Grossing Times of Standard Surgical Pathology CPT Codes by Pathologists' Assistants of Varying Years of Experience

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Background

In the current climate of surgical pathology in both academic and community hospital settings, pathologists' assistants (PAs) have become an invaluable asset to workflow in the anatomic pathology laboratory. Since the initial development of the first PA program in 1969, PAs have grown from simply handling the gross dissection of surgical cases, to playing a much larger role in anatomic pathology which includes, but is not limited to, administrative roles, performance of autopsies and assisting pathologists with research^{1,2}. However, even with the constant evolving scope of practice, gross examination still remains one of the primary roles of a PA.

To date, there is a gap in the existing literature on the divisions of labor and time for a pathologists' assistant. Previous data has predominantly been provided by self reporting and surveys distributed to practicing PAs, but quantifiable data was not obtained^{2,3}. Additionally, studies done at individual institutions have attempted to quantify their workload needs⁴. However, it is unknown if this information would translate to a system that can be applied at other facilities with varying surgical volumes and distribution of labor. While not every surgical specimen will be identical, there are many benefits to being able to have a general idea of workflow in anatomic pathology, particularly with the utilization of PAs. By having a reasonable expectation of grossing time, it becomes possible to plan out gross room activities as well as ensure PAs are not overburdened between grossing surgical cases and additional duties. With this in mind, establishing a standardized approach to grossing time would be critical. Despite specimen variety, surgical specimens are all assigned a distinct billing category signified by Current Procedural Terminology (CPT) codes, which are based on the relative complexity of the specimen received. These codes are used universally throughout the healthcare system to standardize billing and are divided into a technical component and a professional component^{5,6}. Pathologists' assistants account for a portion of the technical component of CPT codes. The codes encountered most frequently in surgical pathology, in order of increasing complexity, are: 88300, 88302, 88304, 88305, 88307 and 88309⁶. While the time spent on the technical component will not always match the time spent on the professional component, the global CPT code used for each specimen will be billed identically regardless of the case. In order to quantify a PA's role in anatomic pathology, the average time spent grossing specimens of each CPT code can be compared to the total volume of specimens with that CPT code.

To assist facilities in understanding the proper number of personnel required to adequately staff pathology labs, this study looked at data regarding the amount of time spent grossing specimens by pathologists' assistants. The specimens were separated into six categories based on CPT code. The assumption was that the more complex specimens, which would be designated with a higher code, would take longer to gross. While there are additional factors that may affect the time it takes for a PA to gross a specimen, such as intraoperative consultations, phone calls, specimen photography and administrative duties, most of these are not able to be accounted for on a daily basis. One additional variable to assess technical skill that could possibly impact grossing times was the years of experience of the grossing PA. The second assumption was made that the more years of experience a PA had, the less time it would take to gross cases of varying complexity.

Methods

This study was conducted over a year and a half, from November 2017 to February 2019, across several academic and community hospitals in the United States¹. These hospitals had varying surgical specimen volumes and pathologist's assistant (PA) staffing. Over 30 ASCP-certified PAs with diverse experience levels participated in timing the gross dissection. Prospective participants and their pathology department administrators provided their consent via Google Form filled out prior to the visit. A research investigator timed participants on-site for approximately half a day, recording data for each case on a standardized form (**Figure 1**). The collected data included annual surgical volume, PA experience, use of dictation software and scanning/tracking equipment, the CPT code of each specimen, and whether consultation was needed. Grossing time was recorded using a stopwatch, starting when the specimen was placed on the bench and stopping after the final cassette was placed in formalin, with interruptions noted and the timer paused. For multipart cases, each part was timed independently, but initial steps were only accounted for in the first part. The date gathered was placed in a sealed envelope and stored securely. The study's significant independent variables were specimen CPT code (88300, 88302, 88304, 88305, 88307, and 88309) and the PAs' years of experience (less than a year, 1-2 years, 3-5 years, 6-10 years and greater than 10 years of experience).

Template for Data Recording Instrument

Equipment: Marathon Adanac 3000 Digital Stopwatch Timer, Data Recording Instrument

Protocol: The stopwatch will be started when the specimen is placed on the gross bench and will be stopped when the last cassette is placed in formalin. Any interruptions to grossing will result in the time being paused and resumed upon continuation of grossing.

Annual Surgical Volume:	
Years of Experience:	<1 1-2 3-5 6-10 >10
Voice Recognition Software Used?	Yes No
Specimen CPT code:	88300 88302 88304 88305 88307 88309
Time:	
Patient History Reviewed/Consult Needed (as part of grossing)?	Yes No
Other pertinent observations which may have affected grossing time:	

Figure 1: Template for Data Recording Instrument

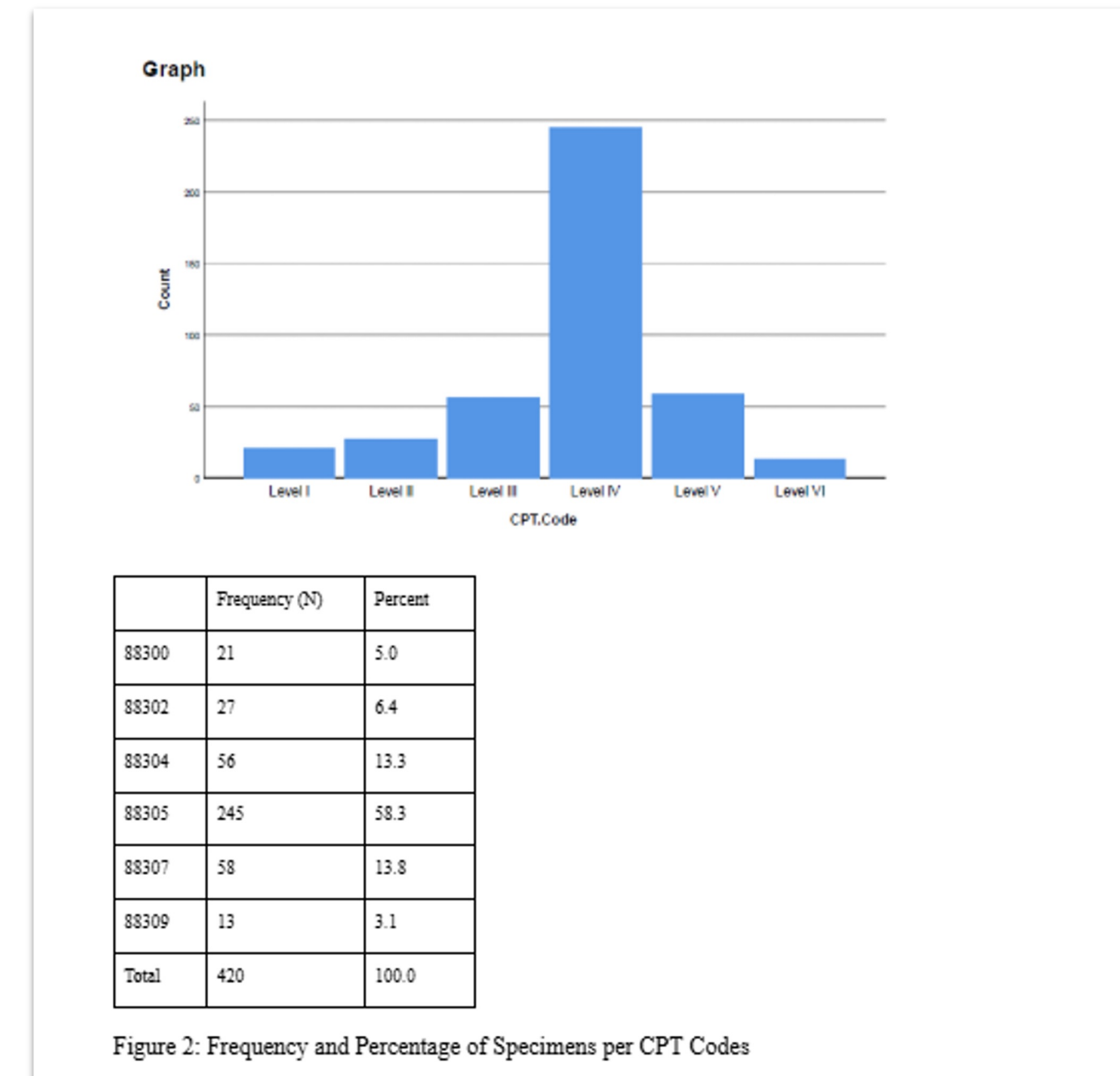


Figure 2: Frequency and Percentage of Specimens per CPT Codes

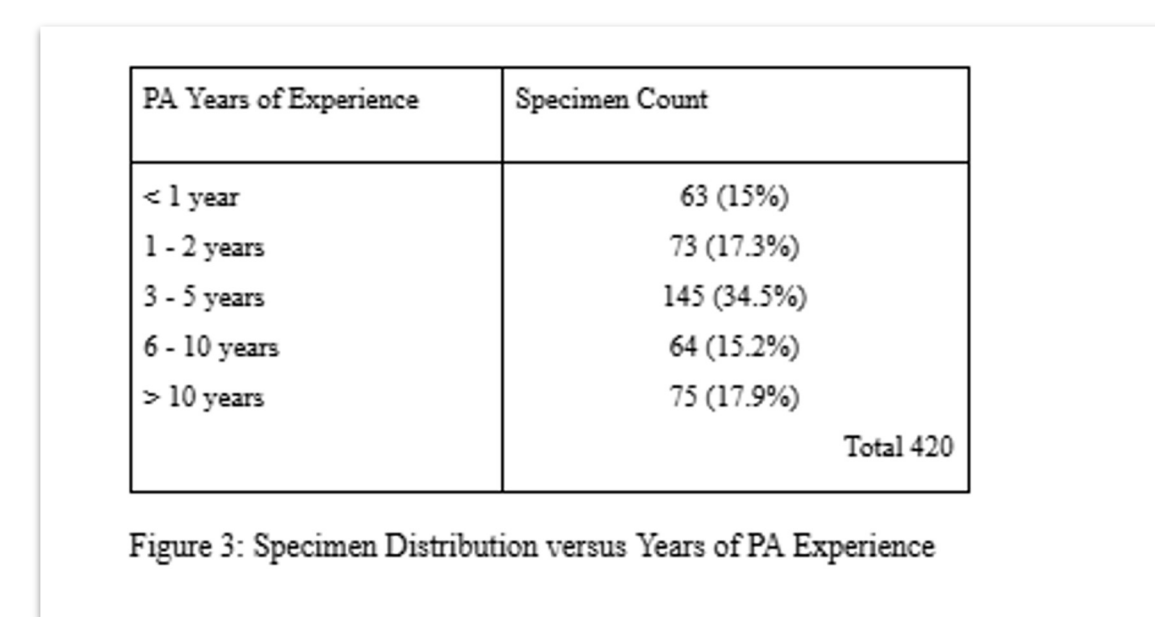


Figure 3: Specimen Distribution versus Years of PA Experience

Results

Laboratory Information and Data Collection

More than 30 healthcare facilities were contacted over the course of a year and a half, with timing data collected from 12 surgical pathology laboratories. A total of 420 specimens were observed, distributed over the six CPT codes, with a majority of the specimens (58.3%) falling in the 88305 category. The distribution of specimens across CPT codes is demonstrated in **Figure 2**. The surgical specimen volume at the observed laboratories ranged from 5,500 to 75,000.

Anonymity was maintained for the grossing PA as well as the health care facility so it is not possible to determine the exact number of contributing pathologists' assistants from the collected data. The level of experience of the grossing PAs was noted and the distribution of grossed specimens among experience levels can be seen in **Figure 3**, with a majority of the grossing (34.5%) of the examined cases being completed by PAs with 3 to 5 years of experience.

Mean Grossing Time and CPT Code

The relationship between grossing time and CPT code is provided in **Figure 4**. The observed trend showed that specimens of low complexity (88300, 88302, 88304 and 88305) had similar mean grossing times (MGT) within an average of 1.5 minutes of each other. The shortest grossing time was seen in specimens of the 88302 category (1.348 minutes). More complex specimens, those categorized as 88307 and 88309 required grossing times averaging 10.196 and 38.016 minutes respectively.

Descriptive Statistics

Data obtained for the dependent variable time spent grossing (TG) for the independent variables CPT code (CPT) and years of experience (YE) are presented in **Figure 5**.

The tests of fixed effects table provides F tests for each of the fixed effects specified in the model. Small significance values less than the assumed alpha of 0.05 indicate that the effect contributes to the model. This table provides estimates of the fixed model effects and tests of their significance. In this case the intercept (CPT code and years of experience combined) and CPT code were statistically significant; whereas years of experience was shown not to be statistically significant.

A mixed model analysis (MMA) was used for this study because it allows for a wide variety of correlation patterns and/or variance-covariance structures to be modeled. The MMA was used as the study contained a continuous dependent variable (time spent grossing) and two categorical independent variables (CPT code and years of experience), at least one independent variable that varies between units and at least one independent variable that varies within units. Units refers to the unit of analysis or subjects.

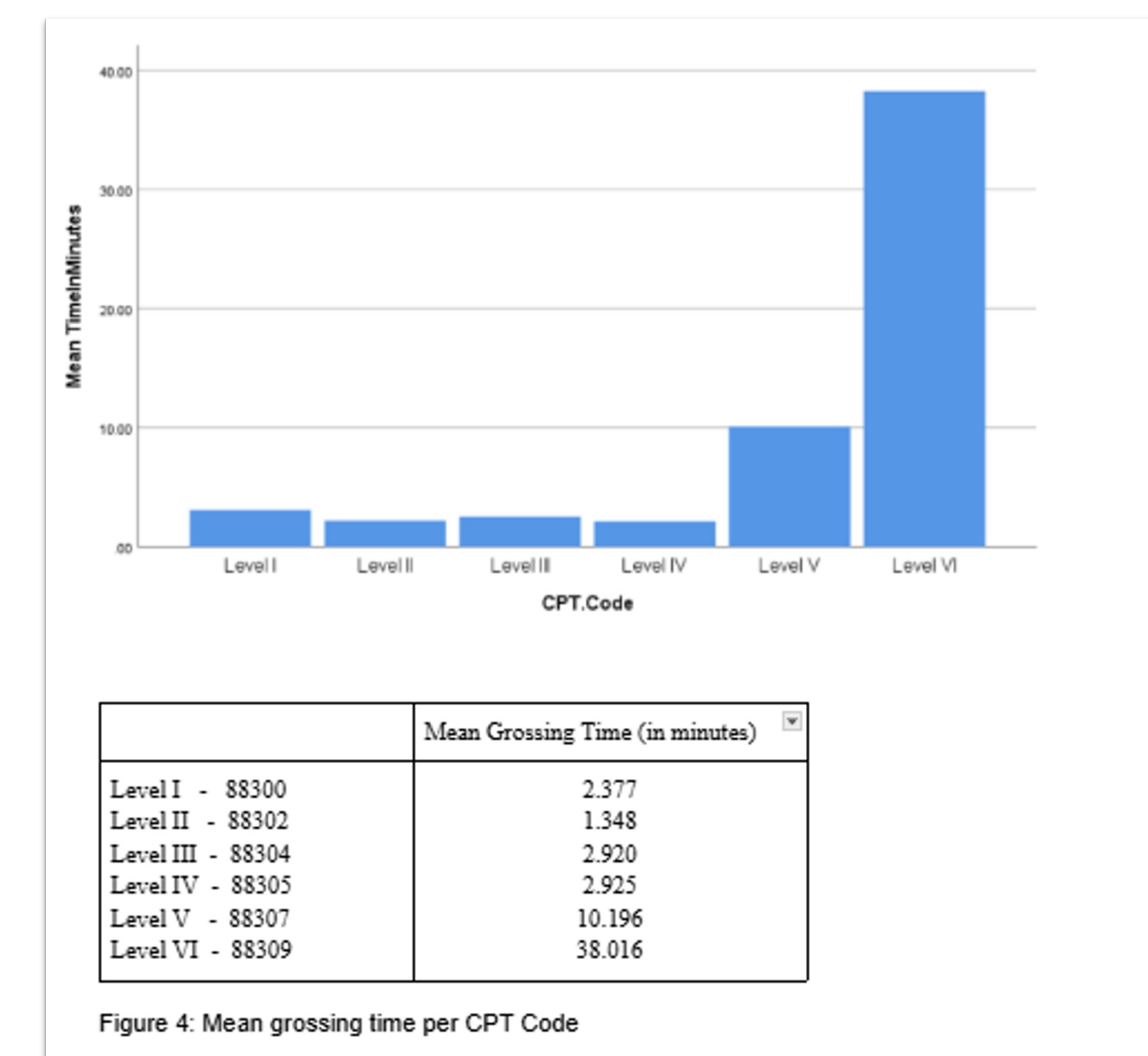


Figure 4: Mean grossing time per CPT Code

Source	Numerator df	Denominator df	F	Sig.
Intercept	1	8.799	92.644	.000
CPT	5	408.290	64.688	.000
YE	4	32.456	.888	.482

Figure 5: Mixed Model Analysis for CPT vs Years of Experience

Conclusion

Determining the mean grossing time (MGT) for specimens can be invaluable for pathology department administration to maintain proper staffing according to specimen volume distribution across different CPT codes. The relationship between CPT code and MGT follows the expected outcome with more complicated cases (higher CPT code) taking longer to gross on average. Of note is the slight increase in grossing time for 88300 specimens compared to the next level up, 88302. This is likely due to 88300 specimens covering a wide range of gross examination only specimens (i.e. orthopedic hardware, explanted devices, etc) whereas 88302 specimens (which include hernia sacs, appendices and traumatic digit amputations) are much more streamlined with their prosections⁹.

It was interesting to see a lack of correlation between MGT and years of experience, although not entirely surprising. Student receive comprehensive training while in a Pathologists' Assistant program which prepares them for a wide range of specimen types⁸. In addition, many grossing practices are becoming standardized through the use of Grossing Guidelines, as distributed by the American Association of Pathologists' Assistants (AAPA), as well as synoptic reporting provided by the College of American Pathologists (CAP)^{7,9}.

While the study factored in common additional tasks performed during grossing (frozen sections, accessioning, addressing lab issues), it did not explore the overall accuracy of grossed cases, which could potentially relate to professional experience and sign-out time. The goal of this study was to quantify the value and workload distribution of pathologists' assistants (PAs) in the surgical pathology laboratory. A key benefit of well-managed workflow is preventing PA burnout, which is a common issue in healthcare and can negatively impact the alertness and proficiency required for accurate specimen submission and identification of unusual findings, ultimately affecting patient care^{10,11}.

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