Schedule of Unit Values

Note: Before reviewing the Schedule of Unit Values for Clinical Laboratory Services, the entire WMS section should be read.

General Instructions

The schedule of unit values provides a coding system for identifying most activities performed in a clinical laboratory. Additionally, it indicates the laboratory activities that should be counted, and lists the unit values for each. Each activity published in this chapter is assigned a five-digit code number and is listed in the Clinical Laboratory Service Recipient Activity List - By Functional Centre.

Any activity in the schedule of unit values can be utilized by any clinical laboratory functional centre if the unit value is accurate and reflective of the realistic average time required to perform a specified activity.

Special instructions and examples of how to simplify the capture of workload units are provided at the beginning of each functional centre section. For those technical activities not listed in the schedule of unit values, please complete a "Request for the assignment of a unit value" and submit the completed form to lab@cihi.ca.

Quality Control:

The conceptual model categorizes quality control as a non-service recipient activity (see activity 02252). Conceptually, the quality control that can be performed for multiple analyses (multiple service recipients) is considered as non-service recipient workload. By doing so, when costing analysis is performed, the workload (and associated human resources expenses) are spread amongst all the tests performed (i.e. overhead costs) for all the service recipients.

There are two approaches to determine the workload for quality control:

a) Determine all the activities listed associated with workload for the quality control and develop an aggregate unit value.
b) Determine the average workload for the test in question and assign the average workload to the QC sample.

The above applies to all the quality control activities that can be performed for multiple samples. For example, calibration samples, commercial accuracy controls, or laboratory samples for precision should all be considered as non-service recipient activities.

Similarly, service recipient test repeats are considered service recipient workload whenever the test result must be confirmed prior to issuing the result. This might include reflex testing activities associated with performing additional testing/analysis according to established protocols and/or best practices. For any of these repeats, the workload for the test repeat is counted.

Special Notes

Activities in the schedule of unit values are listed by functional centre on the basis of where the original time studies were performed and/or the laboratory sections where such activities typically occur. The activities listed are not intended for the sole purpose of any one functional centre. Workload units should be recorded and reported in the functional centre where the activities occur.

Activities not listed

If an activity is performed but is not listed in the schedule of unit values, or if the activity is performed but the unit value is not reflective of the hands-on time required to perform the activity, users are encouraged to perform time studies to determine the appropriate workload unit to assign to the activity. Instructions to perform time studies can be found elsewhere in the section on Conducting a Time Study. If time studies are performed, users are also encouraged to send the results to CIHI (lab@cihi.ca) to ensure that the time studies are considered in any future revision.

TBD unit values

Some activities show a workload unit value as TBD. This means that the average workload unit is yet "To Be Determined" as there were no time studies available at the time of publication, nor was there current experience with the activities within the clinical laboratory working groups. If an organization would like to assist in determining a unit value for one of these activities, they are encouraged to perform a time study and submit the data to CIHI for review by a working group as part of the next revision cycle.

Time Studies

Average-time workload units represent the average number of minutes of hands-on time required to complete a defined activity once. When performing time studies for the clinical laboratory, the following components, or fields of observation, are typically measured:

- Pre-Analytical
    - Service Recipient Preparation/Instructions
    - Test Ordering Mechanism
    - Service Recipient Sampling
    - Specimen Labelling
    - Specimen Preparation for Transport
    - Specimen Reception (includes documentation and logging)
    - Preparation and/or storage (includes separation and preservation)

- Analytical
    - Testing/Analysis
    - Verifying Results
    - Reflex Testing
    - Reporting the Findings including Qualifiers
- Post-Analytical
    - Posting of Results
    - Communication of Results

Clinical Laboratory Service Recipient Activity List - By Functional Centre

Laboratory activities have been grouped into eleven standard sections as follows:

- Pre/Post Analysis
- Clinical Chemistry
- Clinical Hematology
- Transfusion Medicine
- Anatomical Pathology
- Cytopathology
- Electron Microscopy
- Clinical Microbiology
- Immunology
- Histocompatibility and Immunogenetics
- Diagnostic Genetics

Pre/Post Analysis

This section includes a list of activities commonly associated with the procurement of laboratory specimens from service recipients, the receipt and handling of specimens, including registration and data entry, the preparation of appropriate samples for dispatch to outside health service organizations, results reporting, distribution and specimen disposal.

Workload units should not be claimed unless laboratory unit-producing personnel are actively involved in the procurement of the specimen. Many activities described in this section are often performed by staff from another laboratory functional centre and should be collected and reported by the staff performing the activities in the functional centre where the activity is performed.

Activities are grouped and presented under five main headings that include:

- Specimen Procurement
- Specimen Receipt
- Specimen Dispatch
- Registration
- Miscellaneous

Any activity in this list can be utilized by any clinical laboratory functional centre if the unit value is accurate and reflective of the realistic average time required to perform a specified activity.

Recording Instructions

1. Unit values for aggregated activities:
   Unit values for aggregated activities may be used for some activities in the pre/post analysis section. For example, if a venipuncture (code 10030) always includes specimen procurement – basic (code 10000), the organization may assign a combined workload unit for the venipuncture as follows:

10000 – Specimen procurement – basic	1.2
10030 – Venipuncture	1.7
Combined workload unit for each successful venipuncture:	**2.9**

2. Relative unit values for occasional activities
   Relative unit values for occasional activities may be used for some activities in the pre/post analysis section. For example, an organization may choose to develop an aggregate value for a venipuncture that will include an occasional isolation preparation (10030). An audit is performed (retrospectively or prospectively) to determine the frequency in which an isolation preparation is required relative to all venipunctures performed in a representative period of time.

   If the audit determines that 10% of all venipunctures require isolation preparation, the aggregate value for all venipunctures may be determined as follows:

10000 - Specimen procurement – basic	1.2
10030 - Venipuncture	1.7
10090 - Isolation preparation (10% x 4.1)	0.41
Aggregate workload unit for each venipuncture:	**3.31**

   When using relative values for occasional activities, it is important to re-evaluate the percentages used on a regular basis or when the service changes significantly.

3. Deconstructed workload units:
   A deconstructed workload can be used for some activities in the pre/post analysis section. For example, centrifugation (code 12030) is assigned 0.5 workload units per batch. If the organization chooses to collect the centrifugation workload with each specimen rather than by batch, they should conduct an audit (retrospective or prospective) to determine the average number of specimens per batch, and then assign the appropriate workload to each specimen. Assume that an audit determines that, on

average, 12.5 specimens are centrifuged each time. The deconstructed workload is then calculated as follows:

$$\frac{\text{Workload unit per batch}}{\text{Number of specimens per batch}} = \text{workload unit per specimen}$$

$$\frac{0.5}{12.5} = 0.04 \text{ workload units per specimen}$$

When using deconstructed values, it is important to re-evaluate the proportions used on a regular basis or when the service changes significantly.

4. Daily workload assignment:

Daily workload assignment can be used for some activities in the pre/post analysis section. For example, assume that an audit of "Centrifugation, per batch" (code 12030) is undertaken, and an organization determines that 150 centrifugations are performed on a daily basis of which 20% of the specimens are from inpatients, 30% are from client hospital, 40% are from client community and 10% are from client home care.

The daily workload can then be collected as follows:

Total daily workload for code 12030: 150 x 0.5 = 75

Daily workload by category of service recipient:

Inpatients	(20%)	15
Client hospital	(30%)	22.5
Client community	(40%)	30
Client home care	(10%)	7.5

When using daily values, it is important to re-evaluate the percentages used on a regular basis or when the service changes significantly.

Code	Laboratory	Unit Value
Specimen Procurement		
10000	Specimen procurement – basic Includes: order review, preparation of materials, greeting, identifying and instructing the service recipient, specimen labelling, post procurement service recipient care (includes instructions related to glucose tolerance testing). Includes: all types of biological material (e.g. blood, urine, stool,	1.2

Code	Laboratory	Unit Value
	swabs, etc.). Collect this activity once for every service recipient, regardless of the number or type of specimen. In addition, collect the appropriate activity below.	
10030	Venipuncture (> 12 yrs/adult) – each skin puncture regardless of whether or not it was a successful draw	1.7
10090	Isolation activities – includes entry and exit procedures	4.1
10120	Pediatric/special needs venipuncture – (e.g. 12 years and under, severe morbid obesity, mental health issues, elderly, trauma case) This activity includes all the time/effort required to perform a venipuncture on a pediatric service recipient except those steps included in code 10000. Collect once for each skin puncture regardless of whether or not it was a successful draw. Add additional 3.6 workload units for code 10121 if a second staff member assists.	4.0 3.6
10121	Pediatric/special needs venipuncture – second staff member (e.g. 12 years and under, severe obesity, mental health issues, elderly, trauma case [e.g. agitated or disorientation],)	3.6
10150	Infant urine collection Includes application and removal of a sterile urine bag when performed by laboratory staff that are unit-producing personnel.	3.2
10180	Capillary blood collection	5.2
10210	Blood culture Collect this activity once for every skin puncture, regardless of whether or not it was a successful draw. For example, if the practice is to collect one sample from each arm, collect code 10000 (x1), code 10210 (x2). Note: if collecting more than the blood culture, ONLY collect code 10210 for the venipuncture. Do not collect codes 10210 and 10030 together.	5.5
10220	Blood culture – pediatric/special needs (e.g. 12 years and under, severe morbid obesity, mental health issues, elderly, trauma case [e.g. agitated or disoriented]) Collect this activity once for every skin puncture, regardless of whether or not it was a successful draw. For example, if the practice is to collect one sample from each arm, collect code	9.0

Code	Laboratory	Unit Value
	10000 (x1), code 10220 (x2). If a second staff member must attend, add an additional 3.6 workload units (see 10121). Note: if collecting more than the blood culture, ONLY collect code 10220 for the venipuncture. Do not collect codes 10220 and 10120 together.	
10240	Breath test Includes the collection of the first breath sample, the administration of the drink and the collection of the second breath sample.	2.0
10270	Assisting nursing staff with specimen collection from intravenous or intra-arterial 'lines' Includes PICC, Arterial, Central, etc.	2.0
10300	Obtain assistance/provide information to health service providers relating to specimen procurement specific to a service recipient. Examples include: turn off IV, apply armband, identification of service recipient, relaying instructions to nursing staff re: a missing service recipient, responding to an inquiry for information requests specific to a service recipient, etc.	2.0
10330	Collection of a microbiology specimen when performed by laboratory staff that are unit-producing personnel. Applies only if the swab, fluid, scrapings etc. is collected by laboratory staff that are unit-producing personnel. Does not apply to providing instructions for a urine collection – see code 10000.	4.0
Specimen Receipt		
10360	Printing and sorting of specimen labels – per label For labels (e.g. identification labels, bar code labels) that are printed by an HIS/LIS or other information system. (e.g. labels sorted and affixed to match specimens or conversely, specimens sorted and matched to labels.) Do not count for slide labels- the workload is either included in the unit value or, for Anatomical Pathology, see code 62650.	0.4
10500	General receipt – basic Includes: opening package, matching specimen with the requisition, accessioning the specimen*, verifying quality of the	0.6 per specimen for interfaced sites

Code	Laboratory	Unit Value
	specimen, logging/scanning into Hospital Information System/Laboratory Information System (HIS/LIS), time stamping, printing worklists. Also includes the time required to prepare the package/box for return to the collection/testing site. *Specimen accessioning refers to identifying the specimen as having arrived in the laboratory, and determining the testing to be performed. It does not include the time to register the service recipient (enter demographic data) in the LIS or other electronic systems. See codes 11500 and 11550 for registration. Collect this activity once per specimen, regardless of the type of specimen. In addition, collect the appropriate laboratory activity, where applicable. This also applies to packages/batches of specimens that are received from within the facility. (includes accessing pneumatic tube specimen delivery systems).	1.2 per specimen for non-interfaced sites
10530	Re-label specimen with testing site label and applying laboratory barcode Collect only if the receiving laboratory must affix a separate and distinct label.	0.2
Specimen Dispatch		
11030	Simple internal packaging (e.g. pneumatic tube system, packaging in a plastic bag for internal transport) – per batch Collect only one of the following codes for any given packaging activity (11030 or 11060 or 11090). Do not collect more than one code per packaging activity. Count once per batch.	0.6
11060	Packaging with minimal documentation Used for sending specimens from a collection centre or laboratory to another laboratory within the same organization and requiring minimal documentation other than a worklist. The orders or requisitions are electronically transferred from the sending site to the receiving site. Collect only one of the following codes for any given packaging activity (11030 or 11060 or 11090), Do not collect more than one code per packaging activity. Count once per specimen.	0.1
11090	Packaging with testing documentation Used for sending specimens to a separate organization and requiring the preparation of separate requisitions and other	1.0

Code	Laboratory	Unit Value
	clinical documentation. Collect only one of the following codes for any given packaging activity (11030 or 11060 or 11090), Do not collect more than one code per packaging activity. Count once per specimen.	
11120	Packaging using transportation of dangerous goods (TDG) by ground Includes the packaging and documentation required to comply with TDG regulations.	15.0
11150	Packaging using transportation of dangerous goods (TDG) by air Includes the packaging and documentation required to comply with TDG regulations.	20.0
11220	Prepare slides to send for referral to another laboratory Refers to hematology, pathology, cytology or any other slide. Includes collecting the slides and retrieving the pertinent reports/documentation, contacting the other laboratory, packaging and sending the slides. Applies only when slides are prepared by unit-producing personnel. Count once per case regardless of the number of slides.	5.0
Registration These activities may be performed for in-house service recipients or for specimens that are referred-in from another organization, thus requiring service recipient registration in the receiving organization's HIS/LIS.		
11500	Service recipient primary registration – no information in HIS/LIS Includes test order, entering and verifying all the demographic information required by the HIS/LIS registration system – (e.g. name, age, DOB, address, telephone, health insurance number, physician, etc.). Count only if performed by UPP staff.	1.8
11550	Service recipient limited registration Includes test order, reviewing/updating pre-filled registration screens. This occurs when one or two fields are completed and the remaining data fields are automatically populated from a service recipient index (e.g. Central Patient Index). Count once per service recipient.	1.0

Code	Laboratory	Unit Value
	Count only if performed by UPP staff.	
11600	Adding additional test(s) to a service recipient order, per request (regardless of the number of tests added) Includes receiving the request, HIS/LIS search request, order entry and assignment, and retrieval of specimen. Also includes additional orders whether requested from the clinical care area or generated within the laboratory. Count only if performed by UPP staff.	1.9
Miscellaneous		
12010	Aliquotting for internal testing without documentation, per specimen This activity refers to a specimen that is aliquoted for immediate testing or stored internally for testing at a later date. There is only a minimal amount of extra documentation required. Do not use this activity for pouring a specimen from its original container into an instrument testing cup – this activity is included in the testing activity.	0.9
12030	Centrifugation, per batch To be used only for the initial centrifugation of a specimen to separate the cellular components from the liquid components. Centrifugations that are part of washing, or part of an activity are included as part of the activities. Includes setting the program/timer, loading, balancing and emptying the centrifuge. Count one batch for every time the centrifuge is operated for a full cycle, regardless of the number of specimens included. Note that each centrifuge run is considered a batch.	0.5
12050	Rejecting a specimen Includes rejection of a specimen due to hemolysis, non-sufficient quantity of the specimen (NSQ), improper labelling or improper identification, and the associated report.	3.0
12060	Locating a misplaced specimen Includes the time to locate a misplaced specimen, and the required telephone calls if required. Use only if significant time must be used to locate a misplaced or lost specimen. Do not use for simple retrieval of a specimen.	14.0

Code	Laboratory	Unit Value
12070	Other troubleshooting Includes the activities related to the investigation of a specimen that causes questionable results. Includes investigative activities such as communication to obtain service recipient diagnosis or medication history and tracing the specimen collection history.	Actual or Standard Time
12090	Preparation of kits – simple Applies to any in-house prepared simple specimen collection kits that are intended for use by individuals outside the department. Simple refers to kits that require only the collection of different raw material into a single unit (e.g. occult blood kits that contain a specimen card, an applicator stick and instructions).	0.2
12120	Preparation of kits – complex Applies to any in-house prepared complex specimen collection kits that are intended for use by individuals outside the department. Complex refers to kits that require manual manipulation of raw material prior to including it in the kit (e.g. 24 hour urine which includes measuring and adding preservative, adding special warning labels and waiver documentation or cytology kit – measuring preservative, adding warning labels and instructions).	1.7
12180	Autoclaving, per batch Includes programming, loading and emptying of the autoclave. Count once for each complete autoclave cycle. Note that each autoclave run is considered a batch regardless of the contents.	12.0
12210	Racking of specimens for final storage Includes the time required to sort and place specimens in a rack in order to store specimens once all testing has been performed. Do not use for racking of specimens for interim storage prior to the completion of testing. Count once per specimen.	0.05
12240	Volume assessment from primary container Includes an assessment to ensure that the volume/quality of specimen is sufficient for analysis.	0.2
12250	Volumetric assessment from secondary container Includes a transfer of the specimen for a specifically measured assessment by volume or weight into a secondary container (e.g.	2.5

Code	Laboratory	Unit Value
	graduated cylinder) for use in reporting as a result, or in the calculation of the final result. Do not collect if this is a simple visual volumetric assessment based on the markings on the primary container.	
12270	Cancel order – only if performed by laboratory staff that are unit-producing personnel Includes accessing and cancelling the order in the LIS/HIS because of duplicate orders or no specimen received or order error by accessioning UPP. Does not include assessment of the quality of specimen or specimen identification –see code 12050.	0.5
12300	Manual fax results – only if performed by laboratory staff that are unit-producing personnel. Count once per manual fax.	0.6
12330	Phone results – only if performed by laboratory staff that are unit-producing personnel Includes phoning results to a health professional or directly to clients where appropriate, and the required documentation of the communication. Capture once for each completed telephone call.	1.7
12340	Responding to a telephone request for result(s) – only if performed by laboratory staff that are unit-producing personnel Includes locating the result(s), providing the result to a health professional or directly to clients where appropriate, and the required documentation of the communication. Capture once for each completed telephone request.	2.1
12350	Telephoning for missing reports/results. Capture once for each completed telephone request.	Actual or Standard Time
12360	Service recipient incident – only if unit-producing personnel are directly involved in managing the incident Includes unusual incidents such as fainting, vomiting, etc.	Actual or Standard Time
12420	Handling of processed slides from a referring laboratory for pathologists' review – only if performed by unit-producing personnel Includes logging in or documentation at the front end and filing of the final report. Count once per case regardless of the number of slides received.	5.0

Code	Laboratory	Unit Value
12500	Documentation for immigration purposes – only if performed by unit-producing personnel Includes the time to complete the documentation required for specimen collection for immigration purposes (e.g. Federal Health Certificate, identification validation etc.).	15.0
12520	Documentation for paternity testing – only if performed by unit-producing personnel Includes the time required to confirm identity, photograph, and other required documentation to undertake paternity testing.	20.0
12540	Witnessed urine drug screen specimen procurement – only if performed by unit-producing personnel Includes witnessing the specimen collection and associated documentation required for witnessed specimen procurement.	20.0
12600	Manual Entry of Referred-Out Includes the time required to identify the correct patient/specimen/reference range in the LIS/HIS system. Also count the appropriate workload unit code, depending on the clinical area for which the results apply. For example, use 23150 or 23160 for clinical chemistry results. Count once per result.	2.6

Clinical Chemistry

This section includes a list of activities commonly performed in a clinical chemistry laboratory that pertain to the qualitative and quantitative analysis of blood, urine, body fluids, tissues, and other material for the purpose of detecting specific chemical components.

Activities are grouped and presented under ten main headings that include:

- Specimen Preparation Steps
- Automated-Instrument Programming
- Automated-Specimen Introduction
- Automated-Review of Results
- Chromatography
- Immunoassays

- Electrophoresis
- Point of Care
- Manual Testing
- Fetal/Maternal.

Any activity in this list can be utilized by any clinical laboratory functional centre if the unit value is accurate and reflective of the realistic average time required to perform a specified activity.

Recording Instructions

1. Unit values for aggregated activities:
   Unit values for aggregated activities may be used for some activities in the clinical chemistry section. For example, the following is a possible scenario for testing AST in an organization. A clinical chemistry functional centre receives a serum sample (pre-centrifuged), performs the analysis on a random access analyzer, with a manual review of the result, a manual transfer of results to the HIS/LIS, and then storage of the sample.

   Users may develop a combined workload unit value for the AST as follows:

21000 – Instrument programming – random access analyzer	0.5
22090 – Instrument loading/unloading	0.2
23000 – Manual review of results	0.05
23150 – Manual transfer of results	0.3
12210 – Racking of specimens	0.05
Combined workload unit for each AST:	**1.1**

2. Relative unit values for occasional activities
   Relative unit values for occasional activities may be used for some activities in the clinical chemistry section. For example, an organization may choose to develop an aggregate value for an AST that will include an occasional manual dilution for results above the detection range of the method (code 20310). An audit is performed (retrospectively or prospectively) to determine the frequency in which a manual dilution for results above the detection range of the method is required relative to all analyses performed in a representative period of time.

   If the audit determines that 10% of all analyses require dilution, and the organization is determining the aggregate value for AST as described above, then the value is determined as follows:

21000 – Instrument programming – random access analyzer	0.5
22090 – Instrument loading/unloading	0.2
23000 – Manual review of results	0.05

23150 – Manual transfer of results	0.3
12210 – Racking of specimens	0.05
20310 – Dilution for results above the detection range of the method (10% x 0.6)	0.06
Aggregate workload unit for each AST:	**1.16**

When using relative values for occasional activities, it is important to re-evaluate the percentages used on a regular basis or when the service changes significantly.

3. Deconstructed workload units:

A deconstructed workload can be used for some activities in the clinical chemistry section. For example, "Ultracentrifugation" (code 20050) is assigned 1.5 workload units per batch. If the organization chooses to collect the workload for each specimen, they will conduct an audit (retrospective or prospective) to determine the average number of specimens per batch, and then assign the appropriate workload unit to each specimen. Assume that an audit determines that, on average, 3 specimens are ultracentrifuged each time. The deconstructed workload is then calculated as follows:

$$\frac{\text{Workload unit per batch}}{\text{Number of specimens per batch}} = \text{workload unit per specimen}$$

$$\frac{1.5}{3} = 0.5 \text{ workload units per specimen}$$

When using deconstructed values, it is important to re-evaluate the proportions used on a regular basis or when the service changes significantly.

4. Daily workload assignment

Daily workload assignment can be used for some activities in the clinical chemistry section. For example, assume that an audit of "Ultracentrifugation, per batch" (code 20050) is undertaken, and an organization determines that 10 centrifugations are performed on a daily basis of which 20% of the specimens are from inpatients, 30% are from client hospital, 35% are from client community and 15% are from client home care.

The daily workload can then be collected as follows:

Total daily workload for code 20050: 10 x 1.5		15
Daily workload by category of service recipient:		
Inpatients	(20%)	3
Client hospital	(30%)	4.5
Client community	(40%)	6
Client home care	(10%)	1.5

When using daily values, it is important to re-evaluate the percentages used on a regular basis or when the service changes significantly.

The schedule of unit values for the clinical laboratory was developed to list the activities at a granular level so that laboratories can collect and record activities that are specific to a variety of situations (e.g. interfaced, varying instrumentation and levels of automation). Each activity in the clinical chemistry section of the schedule of unit values is distinct from one another. As an example, manual testing does not include data entry, review of results or storage of specimens. These are separate activities and the associated workload units are counted in addition to the manual testing as an aggregated activity.

Code	Laboratory Activity	Unit Value
Specimen Preparation Steps		
20010	Hemolysate preparation – count once for each specimen Examples include cyclosporine, RBC folate, HbA1C, Hb Electrophoresis, etc. To be collected only if the hemolysate is prepared manually. Note that if removal of the supernatant is required, it is collected separately - see code 20090.	1.0
20050	Ultra-centrifugation (for delipidation/clarification of serum) – count once for each batch of specimens centrifuged Includes filling, loading and removing the ultra-centrifuge cup, loading, programming and unloading the ultra-centrifuge.	1.5
20090	Removal of supernatant Includes the pipetting or decanting of a supernatant from one container to another. Can be used for the removal of serum from cells, hemolysate from cell button or serum from the ultra-centrifuged pellet (to be collected only once per activity – not to be collected for cell washing).	0.2
20130	Extractions – solid phase (includes application of vacuum if required) – per extraction	1.5
20170	Extractions – liquid phase – per extraction	2.4
20180	Organic Acid Extraction	12.5
20210	pH adjustment – simple Using pH paper to adjust the pH of a fluid to a certain range (e.g. 24 hr urine).	0.2

Code	Laboratory Activity	Unit Value
	Note: do not combine with code 27560. Count once per specimen.	
20250	pH adjustment – specific Using a pH meter to adjust the pH of a fluid to a specific pH range (e.g. urine catecholamines). Use this activity when there is minimal need to remove and recalibrate the pH meter probe. Note: do not combine with code 27560. Count once per specimen.	1.0
20290	Leukocyte lysis – by sonication or freeze thawing Includes the separation of leukocytes. Count once per specimen.	1.0
20310	Manual dilution for results above the detection range of the method Use this activity only when a manual dilution is required prior to retesting of a result that is above the detection range of the method. Includes the related manual calculations if required. Count once per specimen.	0.6
20330	Recovery for results below the detection range of the method Includes sample pre-treatment, multiple analysis and calculation. Note: collect only code 20330 or code 23050 but not both. Count once per specimen.	3.0
20340	Urine concentration (e.g. minicon filters) Count once per specimen.	0.5
20400	Oxalate assay- manual urine purification Includes pipetting, checking pH of sample, manual mixing and transfer of specimen to tube. Count once per specimen.	5.4
20470	Deproteinization Count once per specimen.	3.0
20490	Manual specimen integrity verification Count this activity ONLY if the manual verification includes a manual rimming of the vacutainer, or if the manual verification results in some other activity being performed (e.g.	0.2

Code	Laboratory Activity	Unit Value
	ultracentrifugation). Count once per specimen.	
Automated Section		
Instrument Programming		
21000	Random access analyzer – multiple analyses of multiple single specimens Includes only the time to program the instrument. Do not collect this activity if using a bi-directional interface between the instrument and the HIS/LIS. Count once per specimen. Note that if the instrument is programmed to perform as a batch analyzer, use code 21020.	0.5
21020	Batch analyzer – single analysis of multiple specimens Includes only the time to program the instrument. Do not collect this activity if using a bi-directional interface between the instrument and the HIS/LIS. Count once per specimen.	0.3
21040	Dedicated analyzer – instrument performs a single analysis on a single specimen without the ability to change the testing menu (e.g. Osmometer, Nova, Clinitek) Includes only the time to program the instrument. Do not collect this activity if using a bi-directional interface between the instrument and the HIS/LIS. Count once per specimen.	0.2
Specimen Introduction		
22090	Input specimen into instrument/instrument loading/instrument unloading May include manual decapping, loading the primary tube or instrument/specimen cup, transfer pipetting if required, preparing the worklist, host query if interfaced with HIS/LIS, removal, recapping and storage of the primary tube or the removal and disposal of the instrument/specimen cups. Count once per specimen.	0.2
22210	Manual specimen introduction to an instrument, one specimen at a time (e.g. blood gas, osmometer or other type of analyzer)	1.5

Code	Laboratory Activity	Unit Value
	Includes the time to hold specimen/specimen cup during the aspiration of the sample, sample aspiration or pushing sample into instrument. Count once per specimen.	
Review of Results		
23000	Manual review of results Includes the manual review of (numerical) results for flags (high/low). Count once per result.	0.05
23010	Autoverification/autovalidation of results The verification and release of results using a computerized system or algorithm that does not require any manual intervention by personnel.	0.0
23050	Manual calculations – collect only if performing manual mathematical functions on multiple values using a manual calculator. (e.g. estimated glomerular filtration rate [eGFR]) Excludes calculations related to out of range results – see codes 20310 & 20330. Count once per specimen.	0.8
23150	Manual transfer of results – numerical or canned messages – electronic Use only for the manual transfer of results from an instrument to an HIS/LIS without an interface. Includes entering and review of the results in the HIS/LIS where there is no HIS/LIS interface. May also include the manual transfer of results from an instrument to a non-electronic format (e.g. paper requisition) Count once per result	0.3
23160	Manual transfer of interpretive results – e.g. chromatography Use only for the manual transfer of results from an instrument to an HIS/LIS without an interface. Includes entering and review of the results in the HIS/LIS Count	2.6

Code	Laboratory Activity	Unit Value
	once for every analysis regardless of the number of results (e.g. count only once for the entire chromatography).	
23200	Obtain clinical or medication history to aid in the interpretation of the result Use only if significant effort (phone call, review of paper record or electronic chart, etc.) is required to obtain the required information. Do not include if the information is readily available.	1.5
Chromatography		
23250	Gas liquid chromatography (GLC) Includes all steps except the specified specimen preparation steps described in codes 20010–20500 and the transfer of results to HIS/LIS. Count once per specimen analyzed (regardless of the number of injections required).	12.0
23280	Manual high pressure liquid chromatography (HPLC) – includes auto sampler Includes all steps except the specified specimen preparation steps described in codes 20010–20500 and the transfer of results to HIS/LIS. Count once per specimen analyzed (regardless of the number of injections required).	12.0
23290	HPLC – quantitative amino acids Includes all steps up to and including the interpretation, except the specified specimen preparation steps described in codes 20010–20500 and the transfer of results to HIS/LIS. Count once per specimen analyzed (regardless of the number of injections required).	30.0
23300	Fully automated high pressure liquid chromatography (HPLC) This activity refers to instruments that require minimal manual intervention and minimal interpretation of the HPLC scan (e.g. Tosoh HbA1c analyzer). These instruments are similar to dedicated analyzers and would use the same unit values. Please refer to the clinical chemistry automated section.	Refer to the clinical chemistry automated section
23310	Thin layer chromatography (TLC) Includes all steps except the specified specimen preparation	12.0

Code	Laboratory Activity	Unit Value
	steps described in codes 20010–20500 and the transfer of results to HIS/LIS. Count once per specimen analyzed (regardless of the number of injections required).	
23340	Gas chromatography/mass spectrometry (GC/MS) Includes all steps except the specified specimen preparation steps described in codes 20010–20500 and the transfer of results to HIS/LIS. Count once per specimen analyzed (regardless of the number of injections required).	15.0
23345	Gas chromatography/mass spectrometry (GC/MS)- Organic Acid Panel Includes all steps except the specified specimen preparation steps described in codes 20010–20500 and the transfer of results to HIS/LIS.	52.3
23370	Tandem mass spectrometry (MS/MS) Includes all steps except the specified specimen preparation steps described in codes 20010–20500 and the transfer of results to HIS/LIS. Count once per specimen analyzed (regardless of the number of injections required).	15.0
Immunoassays		
Immunoassays – applies ONLY to manual radioimmunoassay, **manual** fluorescent immunoassay and **manual** enzyme immunoassays. For automated immunoassays, refer to the automated section.		
23500	Includes all the steps required to generate a result, including assessing against a standard curve, and comparisons of duplicates. Does not include specimen preparation activities described in codes 20010-20500 if these activities are conducted before the analysis. Count once per analysis.	2.6
Electrophoresis		
	Specimen pre-treatment – see the appropriate codes in the specimen preparation steps (e.g. urine concentration)	Refer to the specimen preparation steps in the clinical chemistry section

Code	Laboratory Activity	Unit Value
24020	Electrophoresis – general preparation Includes general preparation activities such as loading the electrophoresis comb, pipetting specimens into wells, labelling and staining the gels (or visualizing solution for isoelectric focusing), and accessing previous results. Collect once per specimen, in addition to the specific type of electrophoresis below.	1.2
24030	Protein electrophoresis Includes activities related specifically to protein electrophoresis such as setting up the migration program, setting up and processing the gels with the appropriate buffers, as well as scanning the stained gel with a densitometer or flatbed scanner and delimiting the scan as required. Collect once per specimen. Also collect workload 24020 and 24060 separately	1.4
24040	Immunofixation Includes activities related specifically to immunofixation such as dilution of specimen and reagents, addition of reagents (e.g. mercaptoethanol), setting up the migration program, loading the comb, setting up and processing the gels with the appropriate buffers, blotting, rehydration, cutting and mounting the stained gels. Collect once per specimen. Also collect workload 24020 and 24060 separately	2.1
24050	Isoelectric focusing (e.g. Oligoclonal banding by isoelectric focusing and immunoblotting) Includes all activities related specifically to isoelectric focusing such as setting up the migration program, setting up and processing the gels with the appropriate buffers, the application of antisera to the gel, blotting, rehydration, cutting and mounting the stained gels. Collect once per specimen. Also collect workload 24020 and 24060 separately	6.8
24055	Capillary electrophoresis Also collect workload 24020 and 24060 separately	1.3
24060	Interpretation	0.7

Code	Laboratory Activity	Unit Value
	Includes the activities related to interpreting the scanned pattern in relation to any previous historical result.	
24080	Consultation Includes the activities related to consultation with another professional about the results. Includes consultation with other areas (e.g. confirmation of a fibrinogen value). Note: If further testing must be performed, collect the appropriate workload units.	Actual or Standard Time
Point of Care (POC) Note: the activities in this section are intended to represent the activities related to testing that may be performed at or near the location where service recipient care is delivered. In some cases, the activities take place near the service recipient; however, in other cases the activities actually take place within the laboratory. The activities below may be collected regardless of the specific location where they are undertaken, provided the hands-on work was performed by unit producing personnel in the clinical laboratory.		
	Use appropriate specimen collection activities and unit values from the pre/post analysis section in the schedule of unit values. For example: 10000 – Specimen procurement – basic 10180 – Capillary blood collection	Refer to the pre/post analysis section
POC Analysis – Instrument Read Cartridges		
24920	POC analysis – instrument read cartridge Examples include glucose meters, BNP. Includes the programming, verification of lot numbers, the introduction of the cartridge and/or the sample to the instrument, the reading of the results, the disposal of any disposable materials, the cleaning of the instrument and reporting of results. Does not include any waiting time while the instrument cycles. Count once per analysis.	1.2
POC Analysis – Manual Read Cartridges		
24940	POC analysis – manually read cartridges – no intermediate step required (e.g. pregnancy test) Includes the verification of lot numbers, the introduction of the sample to the cartridge, the reading of the results, the disposal of any disposable materials and reporting of results.	1.2

Code	Laboratory Activity	Unit Value
	Does not include any waiting time while the test is incubating. Count once per analysis.	
24950	POC analysis – manually read cartridges – with intermediate step such as a wash required (e.g. Triage drugs of abuse) Includes the verification of lot numbers, the introduction of the sample to the cartridge, the reading of the results, the disposal of any disposable materials and reporting of results. Count once per analysis.	2.3
POC Analysis – Agglutination Method		
24960	POC analysis – agglutination method (e.g. Monospot) Includes the verification of lot numbers, the introduction of the sample, the reading of the results, the disposal of any disposable materials and reporting of results. Does not include any waiting time while the test is incubating. If the test requires manual rocking of a card, add the rocking time as follows: 1) Determine the average number of specimens tested on each card 2) Divide the required rocking time by the average number of specimens tested on each card. 3) Add this value to the unit value. Count once per analysis.	1.2
POC Analysis – Dipstick Method		
24970	POC analysis – Dipstick 1-3 components – semi-quantitative or +/- assessment (e.g. Ketostix) Use only for a manual reading of the dipstick by comparison with a colour chart. Count once per specimen.	1.0
24980	POC analysis – Dipstick = 4 components – semi-quantitative or +/- assessment. Use only for a manual reading of the dipstick by comparison with a colour chart. Count once per specimen.	2.0

Code	Laboratory Activity	Unit Value
24990	POC analysis – Dipstick - auto reader any number of components May include the manual confirmation of the dipstick. Do not collect this activity in conjunction with codes 24970 or 24980. Count once per specimen.	0.5
Manual Testing		
Most of the testing has now been automated. The following list is provided to help laboratories who may be performing these analyses manually. The workload units apply only for manual testing and not for an automated system. If an analysis is not found in this list, please complete a "Request for the assignment of a unit value", found in the WMS Appendix and submit the completed form to lab@cihi.ca.		
25150	Amino levulinic acid (ALA) – urine screen Count extraction separately – see codes 20130 or 20170.	6.5
25320	Beta galactosidase – fluorimetric	20.0
25360	Bilirubin – qualitative – stool	5.0
25380	Tablet test (e.g. ictotest, clinitest, acetest)	2.0
25400	Blood – occult – stool Count once per card. If the sample must be smeared on a card by laboratory staff, add 1 additional workload unit.	0.5
25440	Bromides	15.0
25480	Calculus analysis – qualitative Includes specimen preparation and screening for the presence of specific components using colourimetric/commercial kits.	11.0
25520	Calculus analysis – semi-quantitative and/or identification Includes specimen preparation, testing, semi-quantitative estimate and the identification of the components/compounds found in the calculus. Also applies to infra red absorption and X-ray crystallography.	15.0
25600	Carotene	21.0
25641	Sweat Chloride – specimen collection by iontophoresis Includes greeting the patient, preparation of skin, application of discs and electrodes, operation of iontophoresis system, and collection of sweat	9.5

Code	Laboratory Activity	Unit Value
	Note: may also add workload for code 10000	
25642	Sweat Chloride – measurement	Use the automated section of clinical chemistry
25840	Manual cholinesterase phenotyping	30.0
25960	Chylomicrons – visual assessment following refrigerated storage	1.0
26000	Manual citrate – enzymatic, urine	6.5
26080	Cryoglobulin – qualitative	0.5
26090	Cryoglobulin – semi-quantitative	2.0
26120	Crystal analysis – fluids Count once per service recipient slide.	10.0
26160	Cystine, qualitative – urine (nitroprusside)	2.0
26200	Cystine, quantitative – urine	7.0
26400	Fat – qualitative, stool	6.0
26440	Fat – quantitative, stool	37.0
26480	Fatty acids – free	7.5
26640	Free erythrocyte protoporphyrin	12.0
26730	Galactose – 1 – phosphate – red blood cells	TBD
26740	Galactose – 1 – phosphate transferase – red blood cells	34.0
26750	Hemoglobin – spectrophotometric (e.g. free hemoglobin, plasma or urine) Includes any required dilutions.	10.0
26760	Hemosiderin Includes time to prepare the slide by cytospin, stain and read the smear.	10.0
26800	Hexosaminidase – fluorimetric	23.6
26920	5-Hydroxyindoleacetic acid (5-HIAA) – qualitative	9.0
27200	Metal – ICP (Inductively Coupled Plasma)	11.0
27240	Methemalbumin	21.0
27280	Mucin clot	5.0
27320	Mucopolysaccharides – qualitative – urine (Toluidine blue	10.0

Code	Laboratory Activity	Unit Value
	method)	
27340	Mucopolysaccharides – quantitative – urine - high molecular weight; urine preparation; CPC precipitation and treatment.	40.0
27360	Mucopolysaccharides – quantitative, urine – low molecular weight; Dowex columns	75.0
27480	Orotic acid – minicolumn	18.0
27560	pH (using a pH meter) Includes the determination of pH only. Not to be combined with codes 20210 or 20250.	0.5
27760	Porphobilinogen – quantitative	32.0
27800	Porphyrins – qualitative screen	10.0
27880	Porphyrins – quantitative – total and fractionated	23.0
27900	Protein – sulfosalicylic acid – urine	2.0
27960	Specific gravity – by refractometry or densitometry If performed using digital instruments, refer to the clinical chemistry automated section.	1.0
28040	Sulfhemoglobin – spectrophotometric	21.0
28080	Thiocyanates	20.0
28240	Urinalysis – microscopy only	2.0
28360	Urobilinogen – quantitative – stool	35.0
28440	Viscosity	22.0
28460	Xylose	8.0
28470	Urine myoglobin - manual qualitative analysis Includes differential precipitation, dipstick analysis for blood, loading centrifuge, aliquotting and pH sample, re-dipstick testing for blood.	11.5
Fetal/Maternal Note: for automated testing of the markers (e.g. fetal lung maturity by fluorescent polarization) refer to the appropriate workload activities listed in the clinical chemistry automated section of the schedule of unit values.		
29000	Maternal serum screening assessment	10.0

Code	Laboratory Activity	Unit Value
	Comprises the correlation and interpretation of results only.	
29020	Lecithin/sphingomyelin (L/S) Includes the L/S ratio and phosphotidyl glycerol with acetone precipitation and charring.	15.0
29040	Fetal lung maturity (Foam stability – shake test)	4.5
29080	Lamilar body count	2.3
29120	Fetal fibronectin kit Includes filtrate, analysis, recording and reporting of results using a test specific reader.	6.0
29140	Amniotic fluid scan	45.0
29160	Amniotic fluid maternal screening (AFMS)	10.0

Clinical Hematology

This section includes a list of activities commonly performed in a clinical hematology laboratory that pertain to the examination and study of cells and cellular components found in blood and body fluids, as well as the study of coagulation disorders and associated hematopoietic functions.

Activities are grouped and presented under nine main headings that include:

- Specimen Pre-Treatment
- Complete Blood Count-Automated
- Microscopy
- Bone Marrow
- Miscellaneous Manual Hematology
- Manual Coagulation
- Clot Based/Chromogenic Coagulation
- Inhibitor Studies
- Platelet Function Testing
- Seminal Fluid Analysis.

Any activity in this list can be utilized by any clinical laboratory functional centre if the unit value is accurate and reflective of the realistic average time required to perform a specified activity.

Recording Instructions

1. Unit values for aggregated activities:

Unit values for aggregated activities may be used for some activities in the clinical hematology section. For example, the following is a possible scenario for each CBC performed in an organization. The organization always introduces the sample using an autosampling mechanism (code 30600), verifies the results manually (code 30780), manually labels a slide (code 31020), manually prepares a slide (code 31120) and stains the slide using a semi-automated stainer (code 31160). The organization may choose to assign a single workload unit value for each CBC performed as follows:

30600 – Sample introduction auto	0.2
30780 – Verify results manually	0.5
31020 – Manual slide labelling	0.6
31120 – Prepare slide – manual	0.4
31160 – Stain slide – semi automated	0.1
Combined workload unit for each CBC:	**1.8**

2. Relative unit values for occasional activities

   Relative unit values for occasional activities may be used for some activities in the clinical hematology section.

   For example, an organization may choose to develop an aggregate unit value that will be counted each time a slide is reviewed.

   There are a number of ways/reasons to review a peripheral blood smear. A peripheral blood smear may be reviewed to verify the accuracy of a cell count (e.g. assess WBC or platelet count), to review the slide to search for potential abnormalities identified by an automated instrument (e.g. an abnormality may exist in WBC, RBC or platelets), to perform a manual differential, or to enumerate RBC abnormalities. Any of the above may be performed independently or in combination.

   The activities listed in the schedule of unit values related to the review of peripheral blood smear include:

MIS code	Activity description	Unit value
31230	WBC estimate (includes scanning for abnormal morphology)	1.0
31240	Platelet estimate (includes scanning for abnormal morphology)	1.0
31320	RBC Morphology scan- no grading	1.0
31330	RBC Morphology read- with grading	2.5
31360	Flagged scan	1.0
31400	Differential count (WBC =2.0)	2.0
31440	Differential count (WBC <2.0)	5.0

The most accurate method to capture this workload would be to count and record the workload each time each activity is performed. However, this may be impossible in some instances. Users may choose to calculate an average to facilitate the capture of the workload for peripheral blood smear review. The average that is calculated will depend on the practice and the service recipient population in each laboratory.

In order to calculate an average workload per peripheral slide reviewed, an audit must be performed. This may be performed prospectively or retrospectively and should include a representative sample of the service recipient population served. Using the results of the audit, an average workload per peripheral smear reviewed can be calculated.

For example, assume a retrospective two week audit is performed in a laboratory where there were 2,500 peripheral slides reviewed. The results of the audit are:

A	B	C	D	E	F
MIS code	Activity description	Unit value	# performed in the audit	% (D / 2,500)	Relative workload (C x E)
31230	WBC estimate	1.0	2,500	100%	1.0
31240	Platelet estimate	1.0	2,500	100%	1.0
31320	RBC Morphology scan- no grading	1.0	1,500	60%	0.6
31330	RBC Morphology read- with grading	2.5	750	30%	0.75
31360	Flagged scan	1.0	500	20%	0.2
31400	Differential count (WBC =2.0)	2.0	750	30%	0.6
31440	Differential count (WBC <2.0)	5.0	250	10%	0.5
Average Workload associated with each peripheral slide reviewed					4.65

The average workload per slide in this laboratory would be 4.65 units. This unit value could be applied by counting all the peripheral blood smears reviewed and multiplying by the average (4.65).

When using relative values for occasional activities, it is important to re-evaluate the percentages used on a regular basis or when the service changes significantly.

3. Deconstructed workload units:

A deconstructed workload can be used for some activities in the clinical hematology section. For example, manual staining (code 31200) is assigned 2.0 workload units per rack of slides. If the organization chooses to collect the workload for each slide, they will conduct an audit (retrospective or prospective) to determine the average number of slides per rack, and then assign the appropriate workload to each slide. Assume an audit determines that, on average 13.3 slides are stained in each rack. The deconstructed workload is then calculated as follows:

$$\frac{\text{Workload unit per rack}}{\text{Number of slides per rack}} = \text{workload unit per slide}$$

$$\frac{2.0}{13.3} = 0.15 \text{ workload units per slide}$$

Another example shows that the workload unit for automated coagulation requiring the removal of a cap and recapping of the tube (code 36420) is assigned 0.5 workload units per tube. If the organization wishes to attach the workload to each coagulation result instead of to each tube, they will conduct an audit (retrospective or prospective) to determine the average number of results per tube, and then assign the appropriate workload to each result. Assume that an audit determines that, on average, 1.25 coagulation results are required on each tube. The deconstructed workload is then calculated as follows:

$$\frac{\text{Workload unit per tube}}{\text{Number of results per tube}} = \text{workload unit per result}$$

$$\frac{0.5}{1.25} = 0.4 \text{ workload units per result}$$

When using deconstructed values, it is important to re-evaluate the proportions used on a regular basis or when the service changes significantly.

4. Daily workload assignment

Daily workload assignment can be used for some activities in the clinical hematology section. For example, assume that an audit of manual staining (code 31200) is undertaken, and an organization determines that 30 racks of slides are stained on a daily basis of which 20% of the slides are from inpatients, 30% are from client hospital, 40% are from client community and 10% are from client home care. The daily workload can then be collected as follows:

Total daily workload for code 31200: 30 x 2.0		60
Daily workload by category of service recipient:		
Inpatients	(20%)	12

Client hospital	(30%)	18
Client community	(40%)	24
Client home care	(10%)	6

When using daily values, it is important to re-evaluate the percentages used on a regular basis or when the service changes significantly.

5. Bleeding times

In order to simplify the capture of workload units for bleeding times (BT) (codes 36360 and 36400), clinical laboratories may choose to collect workload in one of three ways:

a. Capture 10 workload units for each normal BT, and capture the actual time for each abnormal BT. This mechanism is the same as an actual time methodology and is labour intensive.
b. Capture 10 workload units for each normal BT. Undertake a time study of abnormal BT and capture a standard time for abnormal BT.
c. Determine an average of normal and abnormal BT. This is the simplest method and involves undertaking a time study of abnormal BT and an audit of normal vs. abnormal BT. The calculation of an aggregate workload unit for all BT can then be determined as follows:

   Assume that the time study showed that the average abnormal BT is 17 minutes, and that the audit showed that 10% of all bleeding times performed in the last year were abnormal. An aggregate value for all BT can then be calculated as:

36360 - Normal BT (90% x 10.0)	9.0
36400 - Abnormal BT (10% x 17)	1.7
Aggregate workload unit for each BT:	**10.7**

6. Titres by Agglutination methods

In some cases, an agglutination method is used with serial dilutions to determine a titre. (e.g. for Rheumatoid Factor Titres, Rapid Plasma Reagin Titres, etc.)
For each time a set of agglutination tests are performed count 2.2 workload units for code 36220 Manual Latex Immunoassay Agglutination and add the workload calculated for 36340 Manual rocking.
The above includes the first 3 dilutions. For the next four dilutions, use code 30040 and 30080 for any subsequent dilutions.

7. Recording and reporting of results

Each of the activities includes the recording of results for the first time onto a worksheet or electronically in a computer system. However, if the results are recorded on paper, then transferred manually to an HIS/LIS or transcribed onto a report, extra workload (code 30800 or 30810) should be collected.

Code	Laboratory Activity	Unit Value
Specimen Pre-Treatment		
30000	Manual mixing/single dilutions Includes labelling of tube and addition of all components (e.g. adding PRP and normal plasma). Count once per tube. Do not use for multiple dilutions – see code 30040.	0.5
30040	Serial dilutions Includes labelling of tubes and for up to four dilutions.	1.5
30080	Serial dilutions – each extra dilution above the first set of four dilutions For the first set of dilutions, use code 30040.	0.5
30280	Buffy coat preparation only For staining, use the appropriate staining code(s) 31160 or 31200 and for interpretation use the appropriate reading code(s) 31360, 31400 or 31440. Count once per specimen regardless of the number of buffy coats prepared.	11.0
30320	Heparin neutralization Count once per specimen	1.0
30340	Reticulocyte pre-treatment Use only if performing a reticulocyte count on an automated CBC analyzer, in which the reticulocyte channel requires an external pre-treatment step (e.g. dilute whole blood in a stain and incubate prior to aspirating the sample).	2.0
Complete Blood Count – Automated		
30510	Verify plasma for substances interfering with CBC. (e.g. lipemia, jaundice, hemolysis (includes centrifugation)) Count once per specimen.	0.5
30520	Plasma replacement procedure for substances interfering with CBC. (e.g. lipemia) Includes centrifugation, removal of plasma and replacement for interfering substances as well as associated calculations. Count once per specimen.	2.5

Code	Laboratory Activity	Unit Value
30530	Warming of specimen Count once per specimen.	0.5
30560	Specimen integrity – fibrin clot Refers to the manual examination of a specimen for the presence of a fibrin clot. Count once per specimen. Do not collect if auto detected.	0.2
30600	Sample introduction – autosampling Includes autosampling with a bidirectional interface or autosampling using a worklist. Count once per specimen.	0.2
30680	Sample introduction – manual Includes manually identifying the specimen (barcode wanding or manually entering specimen identification), opening the cap and presenting the sample to the probe, aspirating the sample and recapping. Count once per specimen.	1.0
30710	Sample introduction – fully automated This includes the introduction of a specimen to the instrument without any manual intervention for loading the instrument (front end automation).	0.0
30760	Verify the numerical results manually without flags (collect only if a manual intervention and review is required) Manual verification and assessment of numerical results only without any flags (no access to any flags such as high/low etc.). Use only for the manual transfer of results from an instrument to an HIS/LIS without an interface. Includes entering and review of the results in the HIS/LIS. Count once per specimen.	0.8
30780	Verify the results manually (collect only if a manual intervention and review is required) Verification with a system (or print out) that provides demographics (age, gender, previous results), auto application of reference ranges and delta checks, and	0.5

Code	Laboratory Activity	Unit Value
	generates flags for review (e.g. verify a report with results in numerical values and electronically generated coded flags such as high, low, delta). Use only for the manual transfer of results from an instrument to an HIS/LIS without an interface. Includes entering and review of the results in the HIS/LIS. Count once per specimen.	
30790	Obtain clinical or medication history to aid in the interpretation of the result Use only if significant effort (phone call, review of paper record or electronic chart, etc.) is required to obtain the required information. Do not include if the information is readily available.	1.5
Each of the activities includes the recording of results for the first time onto a worksheet or electronically in a computer system. However, if the results are recorded on paper, then transferred manually to an HIS/LIS or transcribed onto a report, extra workload (code 30800 or 30810) should be collected.		
30800	Manual transfer of results into an electronic system or transcription onto a report to be issued – numerical or canned messages (CBC) Count once for each group of results that are manually entered. Use only for the manual transfer of results from an instrument to an HIS/LIS without an interface. Includes entering and review of the results in the HIS/LIS. Examples: • count once for CBC plus automated differential results manually transferred to the HIS/LIS at one time. (E.g. result is printed on paper and manually entered into HIS/LIS). • Count once for CBC and manual differential/morphology results if they are manually transferred at the same time. • Count twice if the CBC result is manually transferred at a different time than the manual differential/morphology results. • Do not count if the CBC results are electronically transferred via an interface, but count once if the manual	2.0

Code	Laboratory Activity	Unit Value
	differential/morphology result requires manual transfer of results. • Do not count if the manual differential/morphology results are directly entered into an electronic system as part of the 'recording' of the results. • Do not count if the results are electronically transferred via an interface (this includes CBC and/or manual differential/morphology results).	
30810	Manual **transfer** of results into an electronic system or transcription onto a report to be issued – numerical or canned messages (other) Do not count if the results are directly entered into an electronic system as part of the 'recording' of the results. Count once per result other than CBC.	0.3
30830	Autoverification/autovalidation Verification of results performed automatically without staff intervention.	0.0
	Reticulocyte Count the appropriate activities above ONLY if performing the reticulocyte count requires the activities to be performed separately from the CBC. For example, see codes 30340 and 30680.	Refer to the complete blood count – automated section
Microscopy		
31020	Manual slide labelling Count once per slide.	0.6
31080	Slide preparation – semi-automated Includes placing a slide on the instrument and/or removing a slide from the instrument. Count once per slide. Do not collect if the activity takes place without manual intervention.	0.1
31120	Slide preparation– manual Includes the activities related to identifying the specimen, placing the drop of blood on the slide and smearing the blood either with another glass slide or plunger (e.g. Mini-prep).	0.4

Code	Laboratory Activity	Unit Value
	Count once per slide.	
31160	Slide staining– semi-automated Includes activities related to introducing the slide to a spray stainer, or placing the slides in a tray and introducing the tray to an automated bucket staining system. Includes assessment of stain quality. Count once per slide. Do not count this activity if the staining is automatically performed directly from the auto slide maker, without manual intervention.	0.1
31200	Slide staining– manually Use this code only once per **rack** of slides stained. Includes assessment of stain quality. Note: the workload unit may be calculated per slide based on the average number of slides per rack in the laboratory.	2.0
31230	WBC estimate (includes scanning for abnormal morphology) Count once per slide.	1.0
31240	Platelet estimate (includes scanning for abnormal morphology) Count once per slide.	1.0
31320	Morphology scan – no grading Scan validates the red cell indices or validates pre-existing red cell issues without enumerating the specific abnormalities, or reports on normal RBC morphology. Count once per slide.	1.0
31330	RBC Morphology read- with grading Count once per slide. Morphology read includes reviewing and enumerating/grading any red cell abnormalities. Does not include reporting on normal RBC morphology (see 31320).	2.5
31360	Flagged scan Includes a review of the slide for specific cell types based on instrument flags (e.g. blasts, immature WBC, Sezary cells, fragments).	1.0

Code	Laboratory Activity	Unit Value
	Count only one of 31360, 31400 or 31440. Do not capture more than one of these activities for any one slide. Count once per slide.	
31370	Scan body fluid (e.g. CSF) for abnormal cells- no differential performed.	1.0
31400	Differential count (WBC = 2.0) Count only one of 31360, 31400 or 31440. Do not count more than one of these activities for any one slide. Count once per slide.	2.0
31440	Differential count (WBC <2.0) Count only one of 31360, 31400 or 31440. Do not count more than one of these activities for any one slide. Count once per slide.	5.0
Bone Marrow		
Special Instruction: If five Bone Marrow slides are prepared and stained (count 31560 and 31600), and four are scanned and one is used for a **500** cell differential, count workload units as follows: 31630 = 2.5 units x 4 = 10 31640 = 10 units x 5 = 50 Therefore, the sum of both activities is 60 workload units. Alternatively, if the 500 cell differential is performed by doing a **100** cell differential on each slide, count workload units as follows: 31640 = 10 units x 5 = 50 workload units		
31520	Bone Marrow – collection and assistance at the bedside Includes the preparation of the material, assisting the medical personnel performing the bone marrow collection, assessing the adequacy of the specimen and labelling of the specimen. Collect only once for each aspirate attempt or biopsy. Note that travel time is collected separately as a non-service recipient activity.	20.0
31540	Triage of bone marrow specimens Includes preparing or aliquotting specimens for different analyses (e.g. histopathology, flow cytometry etc.). Collect only once per service recipient.	15.0
31560	Bone marrow slide preparation	10.0

Code	Laboratory Activity	Unit Value
	May be used for slides prepared at the bedside or in the laboratory. Count once for all slides prepared from a single sample.	
31600	Bone marrow staining Please use the workload units associated with the appropriate peripheral blood staining activity (codes 31160 or 31200).	Refer to the clinical hematology microscopy section
31630	Bone Marrow slide scan Includes scanning the bone marrow slide to determine the distribution of the cells and/or for abnormal cells. Do not include if the slide is used for a differential.	2.5
31640	Bone Marrow Differential Includes the assessment of cellularity, cell distribution and morphology and a 100 cell differential. Count once for every 100 cells differentiated. If an insufficient number of cells are found on any single slide, use code 31630.	10.0
Miscellaneous Manual Hematology		
33000	Acidified serum lysis (Ham's) test	18.0
33040	Autohemolysis studies	Actual or Standard Time
33080	Capillary fragility or resistance	7.0
33160	Cryofibrinogen	15.0
33200	Donath – Landsteiner	23.0
33240	Heinz bodies, direct	20.0
33260	Hematocrit (manual)	1.2
33280	Hypertonic Cryohemolysis- manual Includes manual calculations.	10.0
33400	L.E. cell, by latex agglutination	8.0
33440	L.E. cell, preparation, stain and examination	28.0
33480	Osmotic fragility, screen	35.0
33520	Osmotic fragility, quantitative	120.0

Code	Laboratory Activity	Unit Value
33565	Malaria (or other blood parasite)- thick slide Includes the examination of the thick slide for the presence of malaria or other blood parasites. Excludes the preparation and staining of slides (see codes 31020-31200). Count once per slide.	7.0
33570	Malaria- thin slide Includes the examination of the thin slide for the presence of malaria or other blood parasites. Excludes the preparation and staining of slides (see codes 31020-31200). Count once per slide.	7.0
33580	Malaria – blood smear for quantification (determination of parasitemia level) Count once per 1000 cells counted.	10.0
33600	Rapid malaria test (e.g. NCS Malaria Rapid Test Kit) Includes specimen preparation, assessment and recording of results. Count once per test.	3.0
33640	Red cell enzymes – qualitative (e.g. G6PD)	9.5
33680	Red cell enzymes – quantitative (Refer to the specimen preparation steps section in clinical chemistry for hemolysate preparation.)	26.0
33720	Red cell creatine	15.0
33745	PBGD (erythrocyte porphobilinogen deaminase) assay- manual quantitative enzyme assay with spectrofluorometric detection. Count once per specimen.	16.0
33760	Manual Erythrocyte sedimentation rate (E.S.R.) Includes the loading and reading of E.S.R.	1.0
33770	Automated Erythrocyte sedimentation rate (E.S.R.) Includes the loading and reading of E.S.R.	0.3

Code	Laboratory Activity	Unit Value
33780	Sickle cell screen – rapid macroscopic – solubility kit (e.g. Sickledex)	6.3
33800	Sickle cell screen – rapid microscopic (e.g. metabisulphate preparation).	10.0
33840	Sucrose lysis	22.0
33860	Fluid – manual cell count (e.g. CSF, pleural)	5.0
33900	Liquefaction of fluid (e.g. addition of hyaluronidase)	1.0
33960	Fluid – preparation by cytospin (e.g. CSF, pleural etc.) Count once per specimen.	2.2
34000	Fluid - Film staining (e.g. CSF, pleural etc.) Please use the appropriate peripheral blood staining activity (codes 31160 or 31200).	Refer to the clinical hematology microscopy section
34010	Coverslipping – manual Count once per slide.	0.4
34020	Coverslipping – semi-automated Includes the time to manually load and unload the coverslipper. Count once per slide.	0.1
34030	Staining and coverslipping – full automation Full automation suggests that there is no manual intervention between the stainer and the coverslipper. Includes the time for the loading, unloading and sorting of slides. Count once per slide.	0.15
34040	Fluids – identify crystals	1.4
34080	Fluids – differential (includes CSF and other fluids)	5.5
34120	Eosinophil, prevalence in sample other than blood	2.0
34200	Hemoglobin A1C – column chromatography	16.0
34240	Hemoglobin analysis by electrophoresis or high performance liquid chromatography (HPLC)	37.0
34320	Hemoglobin fetal, qualitative, stool	12.0
34380	Hemoglobin A2 quantitation by micro column	16.0

Code	Laboratory Activity	Unit Value
34400	Unstable hemoglobin Includes heinz bodies, hemoglobin H inclusions, etc.	10.0
34480	Reticulocyte count, by flow cytometry Capture only if performed on a flow cytometer instrument. Do not capture if performed using flow cytometry technology on a hematology analyzer.	3.0
34520	Reticulocyte count – manual	10.0
34560	Manual white blood cell count – peripheral blood (using a calibrated chamber)	5.0
34600	Special stains – In addition to the following, please see list from anatomical pathology (e.g. Chloroacetate esterase). Count once per slide.	Refer to the anatomical pathology special stains section
34620	Brilliant cresyl blue Count once per slide.	10.0
34640	Hansel stain for eosinophils Count once per slide.	10.0
34660	Leukocyte alkaline phosphatase (L.A.P.) Count once per slide.	Standard time
34680	Myeloperoxidase Count once per slide.	Standard time
34700	Non specific esterase Count once per slide.	Standard time
34720	Tartrate resistant acid phosphatase Count once per slide.	Standard time
Manual Coagulation		
36160	D-Dimer or Fibrin Degradation Products (FDP) – quantitative or semi-quantitative – automated	Refer to the automated coagulation section
36220	Manual Latex Immunoassay Agglutination (e.g. D-Dimer, FDP, etc.)	2.2

Code	Laboratory Activity	Unit Value
	Includes up to three dilutions, placing reagents and sample on cards. For a titre requiring more than three dilutions, use code 30080 for additional dilutions. Refer to code 36340 for manual rocking activity.	
36230	D-Dimer – rapid whole blood agglutination (e.g. SimpliRED). Refer to code 36340 for manual rocking activity.	2.0
36340	Manual rocking If the test requires manual rocking of a card, add the rocking time as follows: 1) Determine the average number of specimens tested on each card 2) Divide the required rocking time by the average number of specimens tested on each card. 3) Add this value to the unit value.	
36360	Bleeding time – normal	10.0
36400	Bleeding time – extended Use this activity if the bleeding time is over the normal range.	Actual or Standard Time
Clot Based/Chromogenic Assays		
36410	Automated coagulation Performing clot based analyses (Prothrombin Time (PT), Partial Thromboplastin Time (PTT), etc. on an automated instrument **with** a cap piercer that does not require manual introduction of plasma or reagents (based on instruments with a bidirectional interface). For instruments requiring manual scanning or manual entry of specimen identification, add the workload unit for code 36430. Count once per tube.	0.3
36420	Automated coagulation Performing clot based analyses (PT, PTT, etc.) on an automated instrument **without** a cap piercer (requires the removal of the cap and recapping of the tube), that does not require manual introduction of plasma or reagents (based on	0.5

Code	Laboratory Activity	Unit Value
	instruments with a bidirectional interface). For instruments requiring manual scanning or manual entry of specimen identification, add the workload unit for code 36430. Count once per tube.	
36430	Manual scanning or manual entry of specimen identification and test programming For use when a bidirectional interface is not available. Count once per tube.	0.4
36440	Autoverification/autovalidation Verification of results performed automatically without staff intervention.	0.0
36450	Rapid HIS/LIS result review Includes the time to review the results and verify correlation of results with other results or previous results. Count once for each result (e.g. count once for each PT reported, regardless of the number of duplicates performed).	0.3
36460	Manual results review (e.g. for clots, abnormal values) Includes the time to review the results and verify correlation of results with other results or previous results when an unexpected result is obtained. Count once for each result (e.g. count once for each PT reported, regardless of the number of duplicates performed). Capture either code 36450 or 36460 but not both. Count also the workload if the abnormal test was re-run.	0.8
36470	Semi-automated coagulation Performing clot based analyses on a semi-automated instrument that requires introduction of plasma and/or reagents and requires constant monitoring. (e.g. fibrometer) Count once for each PT/INR Count once for each PTT Count once per clot based result obtained on a service recipient specimen. For example, if the assay is performed in duplicate, count only once.	3.0 4.0

Code	Laboratory Activity	Unit Value
36490	Manual clot based coagulation (tilt tube or wire loop clot detection) Count once per clot based result obtained on a service recipient specimen. For example, if the assay is performed in duplicate, count only once.	5.0
36560	Clot based factor assays Includes interpretation and reporting (may include reading graph). Add 4.5 units if a manual calibration curve is simultaneously required. Capture workload units for mixing of reagent with plasma (code 30000) and the applicable clot detection activities (codes 36420, 36430, 36470, 36490).	0.5
36580	Clot based coagulation protein assay (e.g. Protein C, Protein S, Activated Protein C) Includes interpretation and reporting (may include reading graph). Capture workload units for mixing of reagent with plasma (code 30000) and the applicable clot detection activities (codes 36420, 36430, 36470, 36490).	5.0
36600	Chromogenic based coagulation protein assay (e.g. Protein C Assay, Protein S Assay, Anti-thrombin III Assay, Factor Xa, Plasminogen, etc.) Includes interpretation and reporting (may include reading graph). Capture workload units for mixing of reagent with plasma (code 30000). Workload units to load/program/unload the instrument may be collected by using the applicable activity for clot detection i.e. codes 36420, 36430. Preparing the calibration curve is captured as a non-service recipient activity.	5.0
36680	Factor XIII screen, urea solubility method Includes incubating, observation for clot lysis and interpretation. Capture workload units for mixing of reagent with plasma (code 30000) separately.	10.0
36760	Fibrinolysis, whole blood clot observation Includes incubating, observation for clot lysis and	7.0

Code	Laboratory Activity	Unit Value
	interpretation and reporting.	
Inhibitor Studies		
36880	Factor inhibitors Includes incubating, interpretation and reporting. Capture workload units for mixing of reagent with plasma (code 30000) and the applicable clot detection activities (codes 36420, 36430, 36470, 36490).	15.0
36900	Bethesda units Includes incubating, calculation/interpretation from graph and reporting. Capture workload units for mixing of normal pool plasma with plasma (code 30000) and the applicable clot detection activities (codes 36420, 36430, 36470, 36490).	5.6
36920	Lupus inhibitors Includes incubating, interpretation and reporting. Capture workload units for mixing of normal plasma, phospholipid and PTT LA with plasma (code 30000) and the applicable clot detection activities (codes 36420, 36430, 36470, 36490).	2.5
36940	Lupus inhibitor by dilute russel viper venom Includes incubating, interpretation and reporting. Capture workload units for mixing of reagent with plasma (code 30000) and the applicable clot detection activities (codes 36420, 36430, 36470, 36490).	2.5
Platelet Function Testing		
37160	ADP release for heparin induced thrombocytopenia	Actual or Standard Time
37180	Platelet rich plasma (PRP) preparation Includes centrifuging whole blood, performing platelet count and dilution(s) to adjust count.	13.0
37200	Platelet aggregation using aggregometer Includes pipetting to cuvettes, incubation, adding agonist, interpretation and reporting. Capture the preparation of PRP (code 37180) separately, if required.	9.0

Code	Laboratory Activity	Unit Value
	Count once per tube.	
37240	Prothrombin consumption test Includes interpretation and reporting. Capture workload units for mixing of reagent with plasma (code 30000) and the applicable clot detection activities (codes 36420, 36430, 36470, 36490).	5.0
37260	Platelet factor III – manual method using kaolin in waterbath Includes incubation, interpretation and reporting. Capture workload units for preparation of PRP (code 37180), mixing of normal pool or PRP with plasma (code 30000) and the applicable clot detection activities (codes 36420, 36430, 36470, 36490).	5.0
37280	Closure time – using platelet function analyzer (e.g. PFA 100 – per cartridge) Includes activities related to the introduction of whole blood to the cartridge and interpretation of results. Count once per cartridge.	1.3
37300	ATP release using luminescence aggregometer Includes adding reagents to plasma in aggregometer, incubation, reading graph, calculating and reporting. Capture workload units for preparation of PRP (code 37180) separately, if required.	10.0
Seminal Fluid Analysis		
37310	Screen for the presence of sperm only Includes smear preparation, staining and examination.	30.0
37320	Complete analysis Includes pH, volume, viscosity, motility, viability, morphology and count.	45.0
37330	Sperm Antibodies Includes preparation of specimen, counting, diluting and agglutination/immobilization of spermatozoa.	TBD

Transfusion Medicine

This section includes a list of activities commonly performed in a transfusion medicine (blood bank) laboratory that pertain to blood transfusion medicine and antibody investigation. Also includes activities relating to the collection, processing, storing, and distribution of blood, blood components or blood products.

Activities are grouped and presented under thirteen main headings with subheadings that include:

- ABO and Rh Grouping
  - ABO and Rh Tube Method
  - ABO and Rh Automated Method
  - ABO or Rh Grouping Discrepancy
- Antibody Screening
  - Antibody Screening Tube Method
  - Antibody Screening Gel Method
  - Antibody Screening Solid Phase Method
  - Antibody Screening Automated Method
- Antibody Identification/Interpretation
  - Antibody Identification Tube Method
  - Antibody Identification Gel Method
  - Antibody Identification Solid Phase Method
  - Antibody Identification Automated Method
  - Antibody Interpretation
- Transfusion
  - Service Recipient Information
  - Crossmatch Electronic Method
  - Crossmatch Tube Method
  - Crossmatch Gel Method
  - Crossmatch Solid Phase Method
  - Crossmatch Automated Method
  - Crossmatch Minor
- Direct Antiglobulin Test (DAT)
  - DAT Tube Method
  - DAT Gel Method
  - DAT Automated Method
- Phenotyping
  - Phenotyping Tube Method
  - Phenotyping Gel Method
  - Phenotyping Automated Method
- Cancellation of Crossmatched Units
- Issue/Release of Blood/Blood Components/Blood Products
- Post Transfusion Activities

    - Disposition and Documentation of Transfused Units
- Investigation of Transfusion Reactions
- Miscellaneous
    - Pre-Treatment of Cells
    - Manipulation of Blood Components/Blood Products
    - Other
    - Documentation
- Bone Marrow/Stem Cell Processing
- Tissue Banking
    - Acquiring Inventory
    - Issue of Tissue
    - Documentation

Any activity in this list can be utilized by any clinical laboratory functional centre if the unit value is accurate and reflective of the realistic average time required to perform a specified activity.

Recording Instructions

1. Unit values for aggregated activities:
   Unit values for aggregated activities may be used for some activities in the transfusion medicine section. For example, assume when an organization receives a request to perform an ABO and Rh grouping, they use the tube methodology and always perform a forward grouping with anti A, anti B and anti A,B (code 40020), reverse grouping with A1 and B cells (code 40060), Rh grouping with 2 antisera (code 40120) and Rh control (code 40160). The organization may choose to develop a combined workload unit on an ABO and Rh grouping as follows:

40020 – Forward grouping with anti A, anti B, anti A, B	2.5
40060 – Reverse grouping with A1 and B cells	2.1
40120 – Rh grouping with 2 antisera	2.1
40160 – Rh control	1.7
Combined workload unit for each ABO and Rh grouping:	**8.4**

2. Relative unit values for occasional activities
   Relative unit values for occasional activities may be used for some activities in the transfusion medicine section.

   The schedule of unit values for transfusion medicine lists an activity for the basic crossmatch for 1 and/or 2 units and another activity for each subsequent unit crossmatched. This is because, on average, it takes a fixed amount of time to perform a crossmatch on the first unit(s); and any subsequent unit requires only incremental time.

In order to implement the new workload measurement system, a laboratory can choose one of several approaches to collect the workload units for crossmatches. The most accurate method would be to count every unit crossmatched for each service recipient. The simplest method would be to assign a workload unit for each unit crossmatched based on the specific proportion of multiple unit crossmatches.

Examples of the two methods above are shown below:

In order to provide numeric examples, the tube crossmatch with automated washes will be used with the following activity codes:

43060 Basic Crossmatch 1 and/or 2 units = 9.3 units

43080 Crossmatch each subsequent unit = 2.8 units

For simplicity, the ABO and Rh and antibody screen are not considered, and only the crossmatch component is considered.

Approach A:

Count every unit crossmatched and use 43060 and 43080 as appropriate for each unit crossmatched

Example: 2 unit crossmatch (total units = 9.3 workload units)

43060 9.3 units

Example: 4 unit crossmatch (total units = 14.9 workload units)

43060 9.3 units

43080 2.8 units

43080 2.8 units

Example: 6 unit crossmatch (total units = 20.5 workload units)

43060 9.3 units

43080 2.8 units

43080 2.8 units

43080 2.8 units

43080 2.8 units

Approach B

Perform an audit of the crossmatches and use a "relative unit for occasional activities" approach and apply the relative workload to each unit crossmatched

In the example, assume that 20,000 crossmatches were performed on 48,200 units and an audit revealed that:

1% of crossmatches were for 1 unit (total units crossmatched = 200)

85% of crossmatches were for 2 units (total units crossmatched = 34,000)

8% of crossmatches were for 4 units (total units crossmatched = 6,400)

5% of crossmatches were for 6 units (total units crossmatched = 6,000)

1% of crossmatches were for 8 units (total units crossmatched = 1,600)

Each unit crossmatched can then be assigned 4.347 units as calculated in column E below:

A	B	C	D	E
# units per crossmatch	Workload unit	Total number of units crossmatched	% of units	Workload unit per crossmatched unit
	From approach A above		C/ total	B x D / A
1	9.3	200	0.41%	0.038589
2	9.3	34,000	70.54%	3.280083
4	14.9	6,400	13.28%	0.494606
6	20.5	6,000	12.45%	0.425311
8	26.1	1,600	3.32%	0.108299
Total		48,200		4.347

In this manner, each unit crossmatched can be assigned 4.347 workload units.

Furthermore, if it is desired, the same approach can be used to assign a relative unit value for each crossmatch regardless of the number of units crossmatched.

When using relative values for occasional activities, it is important to re-evaluate the percentages used on a regular basis or when the service changes significantly.

3. Deconstructed workload units:
   A deconstructed workload can be used for some activities in the transfusion medicine section. For example, pooling of 2-5 units of platelets (code 48040) is assigned 10.5 workload units. If the organization chooses to collect the workload for each unit pooled, they will conduct an audit (retrospective or prospective) to determine the average number of units pooled, and then assign the appropriate workload unit to each platelet unit that is to be pooled. Assume that an audit determines on average, 5 platelet units are pooled each time. The deconstructed workload is then calculated as follows:

   $$\frac{\text{Workload unit per platelet unit pooled}}{\text{Number of platelet units per pool}} = \text{workload unit per platelet unit}$$

   $$\frac{10.5}{5} = 2.1 \text{ workload units per platelet unit}$$

   When using deconstructed values, it is important to re-evaluate the proportions used on a regular basis or when the service changes significantly.

4. Investigation of Transfusion Reactions
   The investigation of transfusion reactions involves a number of activities. Those activities that are usually unique to these investigations are listed as activities, codes 47000-47040.

   However, other testing may occur that may include further or repeat testing. In this case, use the appropriate activity code – for example, if repeating the ABO forward grouping with Anti A, Anti B and Anti A,B, use code 40020.

   If your organization has determined that certain activities will always be performed while investigating a transfusion reaction, you may develop a combined workload unit as described in instruction #1 above.

   Activities related to testing that normally occurs in a different functional centre are described in the appropriate functional centre (e.g. microbiological testing, plasma free hemoglobin, etc.).

   If the testing component of the transfusion investigation is performed by another facility/organization, and the specimen/blood bags are sent out for investigation, use the issue/release activity, code 45320.

Code	Laboratory Activity	Unit Value
ABO and Rh Grouping		
ABO and Rh Tube Method		

Code	Laboratory Activity	Unit Value
(includes any automated washes required) (if using manual washes, add activity 47490)		
40020	Forward grouping using Anti A, Anti B, Anti A,B	2.5
40040	Forward grouping using Anti A, Anti B	2.1
40060	Reverse grouping using A1 and B cells (routine)	2.1
40080	Reverse grouping using A2 Count this activity only if it is performed in addition to routine reverse grouping code 40060.	1.7
40100	Rh grouping using 1 antisera	1.7
40120	Rh grouping using 2 antisera	2.1
40160	Rh control	1.7
ABO and Rh Grouping – Automated Method		
40210	Simultaneously ABO/RH grouping - Automated This activity may be used if performing only ABO/Rh or if performing both ABO/Rh and antibody screening simultaneously. Includes loading the instrument, program selection, unloading the instrument and interpreting the results.	5.4
ABO or Rh Grouping – Discrepancy		
40220	Investigate forward/reverse/Rh grouping discrepancy Includes only the investigation that is not resolved by reverse grouping with A2 cells (code 40080). For example, investigation of rouleaux (washing), Bone Marrow transplant, cold agglutinins (warming), etc. Includes all telephone calls, consultations and other time required to investigate. If a different average time is believed to apply to individual laboratories, time studies are suggested.	35.0
Antibody Screening		
Antibody Screen Tube Method (includes any automated washes required) (if using manual washes, add activity 47490)		
41000	Antibody screen using LISS, Antiglobulin Test (SIDAT) screen, albumin or PEG media – 1 cell – RT, 370 C and anti-AHG/anti-IgG (includes microscopics) Count once for each type of media used.	5.0

Code	Laboratory Activity	Unit Value
41020	Antibody screen using LISS, Antiglobulin Test (SIDAT) screen, albumin or PEG media – 2 cells – RT, 370 C and anti-AHG/anti-IgG (includes microscopics) Count once for each type of media used.	6.0
41060	Antibody screen using LISS, Antiglobulin Test (SIDAT) screen, albumin or PEG media – 3 cells – RT, 370 C and anti-AHG/anti-IgG (includes microscopics) Count once for each type of media used.	7.0
41100	Antibody screen – Cold – 1 cell Includes microscopics.	3.0
41120	Antibody screen – Cold – 2 cells Includes microscopics.	4.0
41140	Antibody screen – Cold – 3 cells Includes microscopics.	5.0
Antibody Screen Gel Method		
41160	Antibody screen – Gel –regardless of the number of cells used	4.0
Antibody Screen Solid Phase Method		
41200	Antibody screen – Solid phase – regardless of the number of cells used	3.0
Antibody Screen Automated Method		
41260	Antibody screen – Automated This activity may be used ONLY if performing an antibody screen as a different batch than the ABO/Rh. If performing the antibody screen and the ABO/Rh as part of the same batch, use code 40210. Includes loading the instrument, program selection, unloading the instrument and interpreting the results.	5.4
Antibody Identification/Interpretation		
Antibody Identification Tube Method (includes any automated washes required) (if using manual washed, add activity 47490)		
42000	Antibody identification using LISS, Antiglobulin Test (SIDAT) screen, albumin or PEG media – 9 cells or less (includes microscopics)	30.0

Code	Laboratory Activity	Unit Value
	Count once for each type of media used.	
42020	Antibody identification using LISS, Antiglobulin Test (SIDAT) screen, albumin or PEG media – 10 to 14 cells (includes microscopics) Count once for each type of media used.	35.0
42040	Antibody identification using LISS, a Antiglobulin Test (SIDAT) screen, albumin or PEG media – 15 to 20 cells (includes microscopics) Count once for each type of media used.	40.0
Antibody Identification Gel Method		
42060	Antibody identification – Gel	8.0
Antibody Identification Solid Phase Method		
42080	Antibody identification – Solid Phase	5.0
Antibody Identification Automated Method		
42090	Antibody identification – Automated Includes loading the instrument, program selection, unloading the instrument and interpreting the results.	5.4
Antibody Interpretation		
42100	Single antibody and/or Simple identification	1.5
42120	Multiple antibodies and/or Complex identification	Actual or Standard Time
Transfusion		
Service Recipient Information		
43000	Transfusion history Includes searching the transfusion history, previous antibody file and any special transfusion requirements.	2.2
43020	Transfusion related laboratory results review Includes checking laboratory results to determine transfusion requirements or cancellation of transfusion (e.g. hemoglobin, platelets, etc.).	2.8
Crossmatch Electronic Method		
43040	Crossmatch Includes retrieval of units, donor cell pack preparation,	2.0

Code	Laboratory Activity	Unit Value
	labelling, tagging and documentation. Includes electronic crossmatching.	
43050	Over-labelling- for manipulation of blood product (e.g. pooling, concentrating, dividing) requiring a change to the product code and necessitates the unit to be over-labelled. Count once per unit.	5.7
Crossmatch Tube Method (includes any automated washes required) (if using manual washed, add activity 47490)		
43060	Basic crossmatch – 1 and/or 2 units using LISS, Antiglobulin Test (SIDAT) screen, albumin or PEG media (includes microscopics) Includes retrieval of units, donor cell pack preparation, labelling, tagging and documentation. Count once for each type of media used.	9.3
43080	Crossmatch each subsequent unit using LISS, Antiglobulin Test (SIDAT) screen, albumin or PEG media (includes microscopics) Includes retrieval of units, donor cell pack preparation, labelling, tagging and documentation. Count once for each type of media used.	2.8
43100	Basic crossmatch – 1 and/or 2 units – immediate spin Includes retrieval of units, donor cell pack preparation, labelling, tagging and documentation.	7.0
43120	Crossmatch each subsequent unit – immediate spin Includes retrieval of units, donor cell pack preparation, labelling, tagging and documentation.	2.0
Crossmatch Gel Method		
43140	Basic crossmatch – 1 and/or 2 units Includes retrieval of units, donor cell pack preparation, labelling, tagging and documentation.	12.0
43160	Crossmatch each subsequent unit Includes retrieval of units, donor cell pack preparation, labelling, tagging and documentation.	3.6
Crossmatch Solid Phase Method		

Code	Laboratory Activity	Unit Value
43180	Basic crossmatch – 1 and/or 2 units Includes retrieval of units, donor cell pack preparation, labelling, tagging and documentation.	9.0
43200	Crossmatch each subsequent unit Includes retrieval of units, donor cell pack preparation, labelling, tagging and documentation.	4.5
Crossmatch – Automated Method		
43220	Crossmatch – automated method Includes loading the instrument, program selection, unloading the instrument and interpreting the results as well as the preparation of the RBC segment to be loaded onto the instrument and retrieval of units, donor cell pack preparation, labelling, tagging and documentation.	9.6
Crossmatch – Minor		
43290	Crossmatch – minor Immediate spin only. Includes retrieval and labelling of units and the performance of the minor crossmatch.	4.0
Direct Antiglobulin Test (DAT)		
Direct Antiglobulin Test Tube Method (includes any automated washes required) (if using manual washed, add activity 47490)		
44000	DAT using a polyspecific reagent	3.8
44020	DAT using a monospecific reagent e.g. C3d	3.8
44040	DAT using both polyspecific and monospecific reagents simultaneously	6.0
Direct Antiglobulin Test Gel Method		
44060	DAT Count once for each card used (polyspecific or monospecific).	5.0
Direct Antiglobulin Test Automated Method		
44063	DAT Count once per specimen.	4.5
Phenotyping		
Phenotyping Test Tube Method		

Code	Laboratory Activity	Unit Value
(includes any automated washes required) (if using manual washed, add activity 47490)		
44500	Antigen phenotyping – direct Count once per unit. Antigen phenotyping: count once for each antigen phenotyped.	3.3
44520	Antigen phenotyping – indirect Count once per unit. Antigen phenotyping: count once for each antigen phenotyped.	7.3
Phenotyping Gel Method		
44525	Antigen phenotyping – direct Count once per unit. Antigen phenotyping: count once for each antigen phenotyped.	6.9
44530	Antigen phenotyping – indirect Count once per unit. Antigen phenotyping: count once for each antigen phenotyped.	7.0
Phenotyping Automated Method		
44555	Antigen phenotyping – direct Count once per unit. Antigen phenotyping: count once for each antigen phenotyped.	6.6
44560	Antigen phenotyping – indirect Count once per unit. Antigen phenotyping: count once for each antigen phenotyped.	6.5
Cancellation of Crossmatched Units		
44890	Cancellation of a crossmatched unit for routine purposes (e.g. after a defined period of time, when service recipient is discharged, surgery is cancelled, or if a double crossmatched unit is used) Includes all documentation required, restocking and	2.0

Code	Laboratory Activity	Unit Value
	associated communications. Excludes the cancellation of the order in the Hospital Information System / (Laboratory Information System (HIS/LIS) (see code 12270 in the pre/post analysis section of the schedule of unit values).	
44900	Cancellation of crossmatched units in unusual circumstances (e.g. shortages, response to an emergency situation) Includes all documentation required, restocking and associated communications. Excludes the cancellation of the order in the HIS/LIS (see code 12270 in the pre/post analysis section of the schedule of unit values).	Actual or Standard Time
Issue/Release of Blood/Blood Components/Blood Products		
45000	Routine issue/release of blood, blood components or plasma protein products Includes all systems of issue/release (electronic, paper, HIS/LIS/paper systems). Includes issue of blood or blood components for exchange transfusions or issue of blood from directed or autologous donors. Count once for each unit issued. A "unit issued" is the unit that is intended to be hung for transfusion.	2.0
45200	Emergency issue/release of red cell units Includes the issue of group specific, uncrossmatched, or incompatible red cells. Count once per unit issued. A "unit issued" is the unit that is intended to be hung for transfusion.	4.0
45320	Issue/release of blood, blood component or plasma protein product for a specific individual service recipient in a different facility Count once per unit issued. Excludes release red cell units to another facility for inventory. A "unit issued" is the unit that is hung for transfusion.	3.0

Code	Laboratory Activity	Unit Value
45340	Packing of blood, blood components or plasma protein for transport to a different facility (Refrigerated) Includes the paperwork and any associated phone calls. Count once per unit. Count as service recipient workload ONLY if the unit has been designated for a specific individual service recipient. • Packing for transport, refrigerated or at room temperatures	3.0
45350	Packing of blood, blood components or plasma protein for transport to a different facility (Frozen) Includes the paperwork and any associated phone calls. Count once per unit. Count as service recipient workload ONLY if the unit has been designated for a specific individual service recipient. • Packing for transport at frozen temperatures (Refer to non-service recipient activity code 02242c for the production of dry ice)	3.0
Post Transfusion Activities		
Disposition and Documentation of Transfused Units		
46500	Presumed transfused with no evidence Capture this activity only if no evidence of transfusion is received and after a certain period of time, the decision is made to presume that it is transfused and document as such. Do not capture this activity if the unit is presumed transfused at the time it is issued.	1.3
46510	Presumed transfused with evidence (e.g. completed issue transfused card/tag and/or partial or empty bag/container) Includes receipt of the completed issue transfused card/tag, matching the donor unit with the service recipient identification number, receipt and disposal of transfused bag and documentation.	1.3
Investigation of Transfusion Reactions		
47000	Clerical check Includes verification of service recipient and donor information.	10.0

Code	Laboratory Activity	Unit Value
47020	Visual inspection Includes inspection of pre and post service recipient sample and donor unit.	1.0
47040	Transfusion reaction documentation Includes the documentation required to be completed manually. Excludes documentation generated from an automated system after the entry of results.	Actual or Standard Time
Miscellaneous		
Pre-Treatment of Cells		
47490	Manual washing Manual washing means that the tubes are decanted and refilled manually between washes. Use this activity in addition to any other activity when manual washes are required. • 4 tubes at a time • 8 tubes at a time • 12 tubes at a time Count only once for the entire series of washes (do not count per tube).	2.5 3.7 5.0
47500	Enzyme pre-treatment of cells Count once per tube of cells treated.	1.5
47520	Pre-warm, pre-treatment of service recipient or reagent cells or saline Includes labelling of tubes, aliquotting and warming. Count once per pre-warm activity.	1.0
47540	Selection of exclusion cells for antibody identification Includes cell selection activities only.	3.0
47560	Elution of cells	21.4
47580	Antibody titre Includes prenatal, WARM autoantibody.	20.0
47600	Adsorption e.g. W.A.R.M. Kit	20.0

Code	Laboratory Activity	Unit Value
	Includes automated washing. Use 47490 if manual washing is performed. Add 10 units for each additional absorption performed on the same specimen.	
47620	Adsorption e.g. EGA, Gammaquinn Add 8 minutes for each additional adsorption done on the same specimen	12.0 8.0
47630	Adsorption- by PEG	16.0
47640	Adsorption- by ZZap Includes thawing DTT, reconstituting papain, preparing ZZAP.	20.0
Manipulation of Blood Components/Blood Products		
48000	Reconstitution of IVIG, per vial reconstituted Count once per vial reconstituted.	5.0
48020	Reconstitution of lyophilized products for infusion, e.g. Factor VIII Count once per vial reconstituted.	4.2
48040	Pooling of platelets, 2 to 5 units	10.5
48060	Pooling of platelets, 6 to 10 units	17.2
48080	Pooling of cryoprecipitate, 2 to 5 units Includes thawing of cryoprecipitate (do not add 48120 in addition to 48080)	10.5
48100	Pooling of cryoprecipitate, 6 to 10 units Includes thawing of cryoprecipitate (do not add 48120 in addition to 48100).	17.2
48120	Thawing products Includes product selection, inspection, thawing, assigning and labelling. Count once per bag thawed.	5.1
48160	Aliquotting of products e.g. pediatric, autologous Includes weighing of product when applicable. Count once regardless of the number of aliquots.	15.0

Code	Laboratory Activity	Unit Value
48180	Plasma reduction • Per red cell unit Count once per unit reduced.	3.0
48190	Plasma reduction • Per pool of platelets Count once per unit reduced	10.0
48200	Irradiation Use only if the irradiation is performed on-site by unit-producing personnel. Count once per unit irradiated.	1.0
48220	Weighing of blood product for special situations other than aliquotting (do not claim both codes 48160 and 48220 together).	1.0
Other		
48400	Kleihauer – Betke – Hb F	10.7
48420	Rosette – Hb F	9.0
48435	Cold agglutinin – thermal amplitude/titre Count only once regardless of the number of screening cells.	12.0
48440	Lookbacks	Actual or Standard Time
48460	Tracebacks	Actual or Standard Time
48480	Blood pack collected from a service recipient for autologous transfusion or for therapeutic purposes Include collection of autologous unit and all documentation. Use only when the activity is performed by unit-producing personnel from the clinical laboratory.	32.0
48481	Documentation of therapeutic phlebotomy (e.g. noting laboratory information relevant to service recipient or non-service recipient activities) Includes disposal of unit if applicable but excludes the	5.0

Code	Laboratory Activity	Unit Value
	phlebotomy. Use only when the activity is performed by unit-producing personnel from the clinical laboratory.	
48482	Receipt of blood pack for autologous transfusion Includes all documentation but excludes the collection of the autologous unit. Use only when the activity is performed by unit-producing personnel from the clinical laboratory.	8.0
48520	Automated washing of donor red cell unit Count once per unit.	18.5
48521	Manual washing of donor red cell unit Includes all repeated washings.	19.5
48540	Automated washing of donor platelet unit Count once per unit.	25.0
48560	Rejecting a specimen/unit Includes rejection of a specimen/unit due to improper labelling or improper identification, and the associated report.	6.0
48580	Locating a misplaced specimen/unit Includes the time to locate a misplaced specimen/unit.	14.0
48600	Other troubleshooting of specimen and/or product for transfusion medicine assessment Includes the activities related to the investigation of a specimen/unit that causes questionable results as well as investigative activities, such as communication, to obtain service recipient diagnosis or medication history and tracing the specimen collection history.	Actual or Standard Time
Documentation		
48700	Documentation related to ordering a product under the Special Access Program (SAP)	15.0
48720	Internal documentation related to adverse reactions Does not include Transfusion Transmitted Injuries Surveillance System (TTISS).	5.0
48730	TTISS documentation related to adverse reactions Includes Transfusion Transmitted Injuries Surveillance	30.0

Code	Laboratory Activity	Unit Value
	System (TTISS).	
48740	Manual - Recipient notification of receipt of blood and/or blood products and/or presence of antibodies Includes the preparation of the letter and associated documentation only when there is an intervention by the unit-producing personnel. Exclude if the letter is generated by an automated system without manual intervention.	8.1
48750	Computer generated Recipient notification of receipt of blood and/or blood products and/or presence of antibodies Includes marking and mailing/sending activities. Count once per service recipient.	2.0
48760	Internal documentation related to providing a product to a service recipient for home or infusion Includes the documentation related to ordering and issuing the product.	5.0
48765	External documentation related to surveillance and utilization database requirements for products used in homes Includes the documentation related to ordering, issuing, follow up and disposition of the product (e.g. C.H.A.R.M. system- Canadian Hemophilia Assessment and Resource Management System).	10.0
48780	Documentation related to lymphocyte infusion to a service recipient	15.0
48785	Manual Review of Results by 2nd UPP: Not to be used when duplicate testing is performed, but for when a 2nd UPP manually reviews the results from the first UPP and documents a validation comment in the LIS.	0.4
48790	Manual Entry of Results: Manually transferring information into the LIS by a UPP to be recorded on a patient's specimen. Includes entering and reviewing the results in the LIS.	0.3
Bone Marrow/Stem Cell Processing		
49000	Collection, processing and storage of bone marrow for infusion (up to 2 bags) Includes all the activities related to the collection of the bone	280.0

Code	Laboratory Activity	Unit Value
49020	marrow, the preparation and addition of preservative, all the washing steps and the appropriate documentation. Add 20 additional workload units for each bag (after the first 2 bags) collected, processed and stored.	20.0
49040 49060	Thawing, issue and preparation for infusion of bone marrow (first bag) Includes the time to retrieve, thaw and prepare the bone marrow, prepare the service recipient room, infuse the bone marrow and all the post infusion documentation. Add 30 workload units for each additional bag infused.	90.0 30.0
Tissue Banking		
Acquiring Inventory		
49200	Activities related to the acquisition of tissue from a local tissue bank for a specific service recipient • Service recipient history check	2.2
49220	Activities related to the acquisition of tissue from a local tissue bank for a specific service recipient • Inventory check	0.5
49240	Activities related to the acquisition of tissue from a local tissue bank for a specific service recipient • Placing order and associated documentation	5.0
49260	Activities related to the acquisition of tissue from a local tissue bank for a specific service recipient • Receipt and storage of tissue	13.5
49280	Activities related to the acquisition of tissue from a local tissue bank for a specific service recipient • Assigning tissue to service recipient	3.8
49300	Activities related to the acquisition of tissue from an external source.	25.0
49360	Activities related to obtaining tissue for autologous transplant and placing tissue in storage. Includes the activities related to the appropriate quarantine measures.	35.0

Code	Laboratory Activity	Unit Value
Issue of Tissue		
49400	Electronic issue/release of tissue Includes selection and retrieval of the tissue, visual inspection, tagging and documentation. Count once per tissue issued	2.3
49420	Packaging tissue for a specific individual service recipient for intra-facility transport.	4.0
49440	Packaging tissue for inter facility transport.	10.0
Documentation		
49480	Documentation related to the disposition of the transplanted tissue	3.0

Anatomical Pathology
This section includes a list of activities commonly performed in an anatomical pathology laboratory that pertain to the performance of gross, microscopic, sub-microscopic, histochemical and immunohistochemical examination of body organs and tissues, including autopsies.

Activities are grouped and presented under six headings that include:

- Autopsy Pathology – Pre-Autopsy Activities
- Autopsy Pathology – Autopsy Activities
- Autopsy Pathology – Assisting with Autopsy Activities
- Surgical Pathology
- Special Stains
- Miscellaneous

Any activity in this list can be utilized by any clinical laboratory functional centre if the unit value is accurate and reflective of the realistic average time required to perform a specified activity.

Recording Instructions

1. Unit values for aggregated activities:
   Unit values for aggregated activities may be used for some activities in the anatomical pathology section. For example, if during the grossing process, cassettes are always manually labelled (code 62050), sorted (code 62200), and loaded and unloaded from a

processor (code 62220), a laboratory may choose to associate the workload with each cassette as follows:

62050 – Prepare the tissue cassettes – manual labelling	0.4
62200 – Sorting/racking of cassettes	0.1
62220 – Load and unload processor	0.05
Combined workload unit for each cassette:	**0.55**

2. Relative unit values for occasional activities

Relative unit values for occasional activities may be used for some activities in the anatomical pathology section. For example, an organization may choose to develop an aggregate value for assisting with an autopsy will include a number of occasional activities. An audit is performed to determine the frequency of each of the activities.

The audit shows the following information about the frequency of activities:
60500 – Assist with external examination only (20% of autopsies)
60510 – Assist with basic dissection (80% of autopsies)
60520 – Assist with X-ray
(20% of autopsies require one area X-rayed)
(15% of autopsies require two areas X-rayed)
(10% of autopsies require four areas X-rayed)
(5 % of autopsies require six areas X-rayed)
60580 – Assist with injection of organs (20% of autopsies)
60640 – Assist with brain cutting, sampling and reporting (10% of autopsies)
60645 – Transfer of trimmed tissue from stock bottle to cassettes (100% of autopsies)

The organization can choose to develop an aggregate value for assistance to all autopsies as follows:

Code	Assist with:	Frequency		Unit value for one activity	Proportion of unit value
60500	external examination only	20%	x	80	16.0
60510	basic dissection	80%	x	90	72.0
60520 – 1	X-ray 1 area	20%	x	10	2.0
60520 – 2	X-ray 2 areas	15%	x	20	3.0
60520 – 4	X-ray 4 areas	10%	x	40	4.0
60520 – 6	X ray 6 areas	5%	x	60	3.0
60580	injection of organs	20%	x	5	1.0
60640	brain cutting, sampling and reporting	10%	x	14	1.4
60645	Transfer of trimmed tissue from stock bottle to cassette	100%	x	10	10.0

Aggregate workload unit when assisting with each autopsy:	**112.4**

As such, an aggregate value of 112.4 workload units may be assigned to every assisted autopsy.

When using relative values for occasional activities, it is important to re-evaluate the percentages used on a regular basis or when the service changes significantly.

3. Deconstructed workload units:
   A deconstructed workload can be used for some activities. For example, manual staining for H&E (code 62480) is assigned 0.25 workload units per rack of slides. If the organization chooses to collect workload for each slide rather than per rack, they should conduct an audit (retrospective or prospective) to determine the average number of slides per rack and then assign the appropriate workload to each slide. Assume that an audit determines that, on average, 12.5 slides are stained on each rack. The deconstructed workload is then calculated as follows:

   $$\frac{\text{Workload unit per rack}}{\text{Number of slides per rack}} = \text{workload unit per slide}$$

   $$\frac{0.25}{12.5} = 0.02 \text{ workload units per slide}$$

   When using deconstructed values, it is important to re-evaluate the proportions used on a regular basis or when the service changes significantly.

4. Daily workload assignment
   Daily workload assignment can be used for some activities in the anatomical pathology section. Usually this will involve non-service recipient activities such as replacing solutions or stains. For example, if it is determined that the standard time to replace solutions on an automated stainer is 15 minutes, and this is performed three times/day, then 45 workload units would be collected on a daily basis. However, if service recipient activities are collected in this manner, the workload must also be collected by category of service recipient. An example could be the centrifugation activity that is found in the pre/post analysis section; assume that an audit of "Centrifugation, per batch" (code 12030) is undertaken, and an organization determines that 150 centrifugations are performed on a daily basis of which 60% of the specimens are from inpatients, 30% are from client hospital and 10% are from client community. The daily workload can then be collected as follows:

   Total daily workload for code 12030: 150 x 0.5 = 75
   Daily workload by category of service recipient:
   Inpatients (60%) 45

Client hospital	(30%)	22.5
Client community	(10%)	7.5

When using daily values, it is important to re-evaluate the percentages used on a regular basis or when the service changes significantly.

5. Application of the activities for embedding to coverslipping
There are a number of approaches that can be used to process a slide from the cut specimen to the stained and coverslipped slide. The processes may be manual or automated; the stain may be a routine stain, special stain or immunohistochemistry stain. For examples of which activities to use, click here.

6. Application of the activities for frozen sections
There are a number of approaches that can be used to process a frozen specimen. The processes may include using multiple chucks, or cutting extra sections from the same chuck or staining other sections. For examples of which activities to use, click here.

7. Grossing Categorization of Specimen Complexity for Grossing
In some laboratories, non-medical personnel may undertake activities related to the gross examination and description of tissue. When these activities are conducted by unit-producing personnel, workload units are collected. The time required to examine tissue varies significantly. However, the following categorization is offered as a guide to defining the types of tissues and the associated workload units that can be collected for each type.

For the purpose of workload assessment for the activity of grossing, specimens have been divided into 6 categories. While this is not an exhaustive list, it is relatively complete and is meant to be a guide to the organization of specimens for the purpose of grossing. This is not meant to be an indicator of the complexity of further examination of the blocked sample nor an indicator for the complexity of diagnosis. Special handling units may be assigned as necessary for those specimens (e.g. kidney biopsy, liver biopsy, muscle biopsy, nerve biopsy, lymph node needle core biopsy, etc.) which, at the time of grossing, require additional handling to ensure maximum potential of sample examination (e.g. stereoscopic examination, etc.).

Category 0 – Grossing Only – no tissue submitted
Tooth, Foreign body

Category 1 – Small, Uncomplicated
Abortions (Products of conception), Atheromatous plaque, Bone curettings for neoplasia, Bone fragments (e.g. rib), Bunion, Bursa, Biopsy for diagnosis (Breast [tru-cut], endocervical, GI, lip, bronchial, larynx, pleura, prostate), Carpal tunnel

tissue, Cholesteatoma, Cysts (skin, Bartholin's gland), Dupytren's fascia, EEA rings, Endometrial curettings, Exostosis, Fallopian tube(s) (for sterilization), Foreign body, Foreskin, Hematoma material, Hemorrhoids, Hernia sac, Hydrocoele, Intervertebral disk tissue, Kidney Biopsy (add special handling – code 62160 – as required), Liver biopsy, Loose bodies (joint), Lymph node (needle core) biopsy, Lymph node (non-lymphoproliferative), Meniscus, Muscle biopsy, Nerve biopsy, Neuroma (ganglion, chalazion), parathyroid, Pilonidal sinus, Pleura, Polyps (nasal, cervical, endometrial), Scar tissue, Skin biopsy (shave, curettage, punch, tag), Teeth, Temporal arteries, Thrombus (emboli), Toe nail, Tonsils/Adenoids, Vaginal mucosa, Vas deferens

Category 2 – Small, Moderately Complicated

Appendix, Breast reduction, Carotid plaque, Colostomy site, Debridement, Diverticulum (Meckel's), Ectopic pregnancy, Fallopian tube (endometriosis), Femoral head, Fingers/toes (non-traumatic), Gallbladder, Heart valves, Joint resection (e.g. Bone-knee), Lipoma, Lung (open or wedge biopsy, lobectomy), Lymph node(s) (lymphoproliferative disorder), Menigioma and dura, Omentum, Ovary with/without fallopian tube (non-malignant), Pannus, Prostate (TURP), Skin biopsy (under 2 cm.), Spleen, Thymus, Uterine fibroids

Category 3 – Small, Complicated

Adrenal gland, Amputation, Brain biopsy, Breast lumpectomy, Cervical cone biopsy (LEEP), Fetus (no anomalies), Pancreas, Parotid/other salivary gland, Placenta, Testes with/without epididymis (castration), Thymoma, Uterus (with/without tubes/ovaries – non neoplastic)

Category 4 – Large, Moderately Complicated

Axillary dissection (without lumpectomy), Bowel segment (small or large bowel), Brain tumour (lobectomy), Breast needle localization biopsy, Breast simple mastectomy, Fetus (with abnormalities), Liver lobectomy, Nephrectomy (non-neoplastic), Ovary (with/without fallopian tube, neoplastic), Penis resection, Skin wide excision (over 2 cm.), Stomach (partial gastrectomy, non-neoplastic), Testes (with/without epididymis, neoplastic), Thyroid (lobe or total), Uterus (with/without tubes/ovaries, neoplastic)

Category 5 – Large, Complicated

Breast modified radical mastectomy, Chest wall tumour, Colon segment (neoplastic), Cystectomy (with/without nodes), Jaw, (resection, neoplastic), Laryngectomy, Limb (neoplastic), Lung (pneumonectomy), Neck, (radical resection), Nephrectomy (neoplastic), Pelvic exenteration, Prostatectomy, Stomach (total gastrectomy), Subcutaneous tissue lesion (neoplastic), Vulvectomy, Whipples's resection of pancreas

8. Categorization of Specimen Complexity for Embedding and Microtomy

Similar to the activities of grossing, the time required for the activities of embedding and microtomy varies depending on the type of tissue. The workload units are based on timings performed on the following categorization scheme.

Category	Description	Embedding	Microtomy	Example
A	One or more large tissues that may require flat embedding	Uncomplicated requiring minimal orientation	Uncomplicated	Breast, uterus, prostate, lipoma, femoral head
B	Tissue to be embedded on edge	Moderately complicated requiring some relatively simple orientation	Uncomplicated	Membranous cysts, gallbladder
C	Tissues requiring specific orientation to be cut in a plane at right angles, or tubular structures, diagonal embedding or multiple tissue specimens.	Moderately complicated requiring some relatively simple orientation	Complicated due to depth of cut, specific orientation of tissue or sensitivity of trimming	Arteries, vas deferens, fallopian tubes, appendix, skin, epithelial biopsies, endometrial curettage, bone fragments, TURP
D	Multiple biopsies to be embedded in the same block	Moderately complicated requiring specific orientation	Complicated due to depth of cut, specific orientation of tissue or sensitivity of trimming	GI biopsy, cervical biopsy, cardiac biopsy, bone marrow biopsy
E	Multiple **core** biopsies to be embedded in the same block	Time consuming requiring minimal orientation of small tissue but also requiring specific attention to detail (fastidious)	Complicated due to depth of cut sensitivity of trimming	Prostate biopsy, liver biopsy, breast biopsy

9. Staining

Automated staining generally requires approximately the same amount of time, regardless of the stain performed. Also, preparation and loading of the solutions onto

the stainer are all considered non-service recipient activities. Therefore, workload is only collected for automated special staining (62500), but not in conjunction with the workload for manual special staining (62900-69100).

Special stain workload units are intended to represent the amount of hands-on activity required to perform manual staining only. Therefore, do not count workload for automated special staining (62500) in conjunction with workload for manual special staining (62900-69100).

Workload for special stains is associated for each batch. For example, if one slide is stained or 5 slides are stained, capture the same workload.

Note: Most stain preparations and loading a stainer are considered non-service recipient activities and the workload units should be categorized as such.

10. Quality Control

If quality control is performed on the same slide (internal control) then the unit value is collected only once as a service recipient activity. However, if a separate slide is prepared alongside the service recipient's slide, collect the workload once as service recipient workload and once as non-service recipient (for the Quality Control workload)

Code	Laboratory Activity	Unit Value
Autopsy Pathology – Pre-Autopsy Activities		
60100	Autopsy clinical history Includes a full review of the chart, compiling and summarizing information, writing the history and communication/meeting with medical staff. Capture this activity only if performed by unit-producing personnel (e.g. pathologist's assistant, MLT, morgue assistant). Exclude if this activity is performed solely by medical staff (e.g. pathologist, resident).	30.0
Autopsy Pathology – Autopsy Activities		
60190	External examination only Includes a detailed external inspection or analysis of the body to determine whether to proceed with the complete autopsy and documentation of findings. Capture this activity only if performed by unit-producing personnel (e.g. pathologist's assistant, MLT, morgue assistant).	80.0

Code	Laboratory Activity	Unit Value
	Exclude if this activity is performed solely by medical staff (e.g. pathologist, resident).	
60200	Autopsy – basic dissection Includes identifying the body, preparing the body, weighing and description of the body, evisceration, dissection of trunk organs, documentation of findings and cleaning and closing the body. Capture this activity only if performed by unit-producing personnel (e.g. pathologist's assistant, MLT, morgue assistant). Exclude if this activity is performed by medical staff (e.g. pathologist, resident). Count once per autopsy. (Count code 60490 separately as appropriate).	180.0
60240	Photograph of body Capture this activity only if performed by unit-producing personnel (e.g. pathologist's assistant, MLT, morgue assistant). Exclude if this activity is performed by medical staff (e.g. pathologist, resident).	5.0
60260	Photograph of organ Capture this activity only if performed by unit-producing personnel (e.g. pathologist's assistant, MLT, morgue assistant). Exclude if this activity is performed by medical staff (e.g. pathologist, resident). Count once per organ photographed.	5.0
60280	Injection of organs Capture this activity only if performed by unit-producing personnel (e.g. pathologist's assistant, MLT, morgue assistant). Exclude if this activity is performed by medical staff (e.g. pathologist, resident). Count once per organ injected.	5.0
60300	Remove and fix spinal cord Capture this activity only if performed by unit-producing personnel (e.g. pathologist's assistant, MLT, morgue assistant). Exclude if this activity is performed by medical staff (e.g. pathologist, resident).	15.0

Code	Laboratory Activity	Unit Value
60320	Distension (perfusion of organ with fixative) (e.g. lungs) Capture this activity only if performed by unit-producing personnel (e.g. pathologist's assistant, MLT, morgue assistant). Exclude if this activity is performed by medical staff (e.g. pathologist, resident). Count once per distended organ.	7.0
60340	Brain cutting, sampling and documentation Includes brain removal, cutting, fixation, and the appropriate sampling of specific areas. Capture this activity only if performed by unit-producing personnel (e.g. pathologist's assistant, MLT, morgue assistant). Exclude if this activity is performed by medical staff (e.g. pathologist, resident).	45.0
60400	Cardiovascular investigation Includes a detailed investigation (weighing, dissection and measuring) of the heart and its vessels. Capture this activity only if performed by unit-producing personnel (e.g. pathologist's assistant, MLT, morgue assistant). Exclude if this activity is performed by medical staff (e.g. pathologist, resident).	45.0
60420	Collection of samples from autopsy for ancillary studies (e.g. aspirates, bone marrow, tissue for electron microscopy, specimens for cultures) Capture this activity only if performed by unit-producing personnel (e.g. pathologist's assistant, MLT, morgue assistant). Exclude if this activity is performed by medical staff (e.g. pathologist, resident). Count once per case (autopsy) for all samples collected.	15.0
60480	Open sinuses Capture this activity only if performed by unit-producing personnel (e.g. pathologist's assistant, MLT, morgue assistant). Exclude if this activity is performed by medical staff (e.g. pathologist, resident).	20.0
60490	Cut, trim and transfer tissue to stock bottle (or directly to cassettes)	5.0

Code	Laboratory Activity	Unit Value
	Capture this activity only if performed by unit-producing personnel (e.g. pathologist's assistant, MLT, morgue assistant). Exclude if this activity is performed by medical staff (e.g. pathologist, resident). Count once per organ (e.g. liver, kidney) to a maximum of 50 workload units.	
Autopsy Pathology – Assisting with Autopsy Activities Note: these activities are to be counted ONLY by the second person (unit-producing personnel)_when they are actively assisting with the autopsy activities. There are some activities in the previous section that do not have a similar activity in this section because the activity does not usually require assistance (e.g. codes 60300, 60320, 60400, 60420. 60480).		
60500	Assist with external examination only Includes assisting the medical/technical staff with the detailed external inspection or analysis of the body to determine whether to proceed with the complete autopsy.	80.0
60510	Assist with autopsy – basic dissection Includes activities associated with assisting the medical/technical staff with identifying the body, preparing the body, weighing and description of the body, evisceration, dissection of trunk organs, documentation of findings and cleaning and closing the body. Includes only the hands-on time.	90.0
60520	Assist with x-ray of body – regardless of the number of x-rays Includes activities associated with assisting the medical/technical staff with x-raying the body. Count once per area of the body x-rayed (once each for the following areas: leg(s), arm(s), trunk, head) to a maximum of 60 workload units.	10.0
60580	Assist with injection of organs (e.g. contrast media) Includes activities associated with assisting the medical/technical staff with the injection of organs. Count once per organ injected.	5.0
60640	Assist with brain removal, fixation and cutting Includes activities associated with removal of the brain and assisting the medical/technical staff with brain fixation.	14.0
60645	Transfer of trimmed tissue from stock bottle to cassettes	10.0

Code	Laboratory Activity	Unit Value
	May also be used if the tissue is transferred directly from the dissection to the cassette. Capture this activity only if performed by unit-producing personnel (e.g. pathologist's assistant, MLT, morgue assistant). Exclude if this activity is performed by medical staff (e.g. pathologist, resident). Count once per case.	
60650	Release of the body following autopsy – Capture this activity only if performed by unit-producing personnel (e.g. pathologist's assistant, MLT, morgue assistant). Exclude if this activity is performed by medical staff (e.g. pathologist, resident) or non-laboratory staff (e.g. security).	10.0
Surgical Pathology		
62000	Receipt/triage/logging-in/accessioning of tissue/specimen for histopathological assessment Includes separating out containers, matching the containers to the requisitions, assessing the quality of the specimens, prioritizing and sorting by specimen type, accessioning the specimens by assigning a number into the hospital information system (HIS) / laboratory information system (LIS) or logging it manually and sorting the specimens numerically. Excludes registration of service recipient in HIS/LIS (see codes 11500 – 11550). Count once per specimen for histopathological assessment.	1.3
62020	Troubleshooting the tissue/specimen for histopathological assessment Includes activities associated with telephone calls and follow-up and/or storage of specimen until confirmation of specimen identification and/or type is received.	Actual or Standard Time
62050	Prepare the tissue cassettes – manual labelling Includes selecting correct cassettes for specimen types and labelling the cassettes manually with the accession number using an embosser and pen. Count once for every cassette.	0.4
62060	Prepare the tissue cassettes – labelling with an embosser	0.4

Code	Laboratory Activity	Unit Value
	Includes sorting and selecting correct cassettes for specimen types, labelling the cassettes, and cassette lid attachment after specimen placement. Count once for every cassette.	
62070	Prepare the tissue cassettes – embossing via the HIS/LIS interface Includes fully automated embossing via the HIS/LIS interface device and cassette lid attachment after specimen placement. Count once for every cassette.	0.1
62080	Surgical specimen grossing rounds/consultation Includes the time spent with medical staff consulting on the cases/tissues to be grossed in a grossing session. Capture this activity only if performed prior to undertaking the grossing activity. Exclude if the consultation occurs with each individual specimen during the grossing process. Count once per unit-producing personnel involved, per case.	2.9
62090	Distension (perfusion of organ with fixative) (e.g. lungs or preparation of large tissue prior to grossing)	7.0
62100	Gross description only – no tissue submission – complexity 0* Includes verification of the specimen with the demographics, describing, measuring, and weighing the specimen. Capture this activity only if performed by unit-producing personnel (e.g. pathologist's assistant, MLT). For multiple specimens of similar complexity, count once per specimen. Exclude if this activity is performed by medical or professional staff (e.g. pathologist, resident). Add 2.0 workload units when using continuous speech voice recognition systems or when the dictated gross report must be reviewed by unit-producing personnel.	1.0
62110	Gross description only – complexity 1* – small uncomplicated Includes verification of the specimen with the demographics, describing, measuring, and weighing the specimen. Capture this activity only if performed by unit-producing	1.0

Code	Laboratory Activity	Unit Value
	personnel (e.g. pathologist's assistant, MLT). For multiple specimens of similar complexity, count once per specimen. Exclude if this activity is performed by medical or professional staff (e.g. pathologist, resident). Add 2.0 workload units when using continuous speech voice recognition systems or when the dictated gross report must be reviewed by unit-producing personnel.	
62120	Gross description and submission of tissue – complexity 2* – small, moderately complicated Includes verification of the specimen with the demographics, describing, measuring, and weighing the specimen. Capture this activity only if performed by unit-producing personnel (e.g. pathologist's assistant, MLT). For multiple specimens of similar complexity, count once per specimen. Exclude if this activity is performed by medical or professional staff (e.g. pathologist, resident). Add 2.0 workload units when using continuous speech voice recognition systems or when the dictated gross report must be reviewed by unit-producing personnel.	5.0
62130	Gross description and submission of tissue – complexity 3* – small complicated Includes verification of the specimen with the demographics, describing, measuring, and weighing the specimen. Capture this activity only if performed by unit-producing personnel (e.g. pathologist's assistant, MLT). For multiple specimens of similar complexity, count once per specimen. Exclude if this activity is performed by medical or professional staff (e.g. pathologist, resident). Add 2.0 workload units when using continuous speech voice recognition systems or when the dictated gross report must be reviewed by unit-producing personnel.	10.0
62140	Gross description and submission of tissue – complexity 4* – large, moderately complicated	15.0

Code	Laboratory Activity	Unit Value
	Includes verification of the specimen with the demographics, describing, measuring, and weighing the specimen. Capture this activity only if performed by unit-producing personnel (e.g. pathologist's assistant, MLT). For multiple specimens of similar complexity, count once per specimen. Exclude if this activity is performed by medical or professional staff (e.g. pathologist, resident). Add 2.0 workload units when using continuous speech voice recognition systems or when the dictated gross report must be reviewed by unit-producing personnel.	
62150	Gross description and submission of tissue – complexity 5* – large complicated Includes verification of the specimen with the demographics, describing, measuring, and weighing the specimen. Capture this activity only if performed by unit-producing personnel (e.g. pathologist's assistant, MLT). For multiple specimens of similar complexity, count once per specimen. Exclude if this activity is performed by medical or professional staff (e.g. pathologist, resident). Add 2.0 workload units when using continuous speech voice recognition systems or when the dictated gross report must be reviewed by unit-producing personnel.	37.0
62160	Special handling for gross description to ensure maximum potential of sample examination (e.g. stereoscopic examination, multiple fixatives, radiologic examination for microcalcifications, etc.). Add to the activity of gross description. Capture this activity only if performed by unit-producing personnel (e.g. pathologist's assistant, MLT). Exclude if this activity is performed by medical or professional staff (e.g. pathologist, resident).	5.0
62162	Touch preparation Includes the labelling of the slide and the preparation of a touch preparation by unit-producing personnel only (capture the staining separately).	0.1

Code	Laboratory Activity	Unit Value
62165	Centrifugation of biopsy or other small pieces of tissue Includes the collection, centrifugation and removal of small pieces of tissue to a cassette.	1.7
62167	Manual transfer of slides to oven for drying Count once per activity (E.g. 5 slides are transferred to oven in a batch, therefore count the workload once only)	0.1
62170	Macroscopic photographing of tissue Count once per case.	5.5
62200	Sorting/racking of cassettes Includes the activities of sorting the cassettes according to process time, and the resorting of cassettes after processing to group them by case or in numerical order. Count once per cassette.	0.1
62220	Load and unload processor Includes programming/selecting/editing program. Count once per cassette.	0.05
62230	Reprocessing Includes the time to manually reprocess (i.e. remove wax and return the tissue to a state where processing can be repeated). Exclude if re-processing is done on an automated processor. Use the original code 62220 for the second processing. Count once per cassette.	2.0
62235	Slide maintenance- de-colourizing. Includes slide retrieval, removal of the coverslip, repair of broken slides and destaining. May include removal of foreign tissue. See appropriate staining and coverslipping activities when restaining (if required) or re-coverslipping (if required).	1.8
62250	Paraffin embedding and microtomy of first unstained slide only by specimen grouping A** Includes embedding, rough cutting, trimming, floating, mounting of unstained tissue on slide and labelling of slide. Includes first unstained slide only.	1.8

Code	Laboratory Activity	Unit Value
62260	Paraffin embedding and microtomy of first unstained slide only by specimen grouping B** Includes embedding, rough cutting, trimming, floating, mounting of unstained tissue on slide and labelling of slide. Includes first unstained slide only.	1.9
62270	Paraffin embedding and microtomy of first unstained slide only by specimen grouping C** Includes embedding, rough cutting, trimming, floating, mounting of unstained tissue on slide and labelling of slide. Includes first unstained slide only.	2.2
62280	Paraffin embedding and microtomy of first unstained slide only by specimen grouping D** Includes embedding, rough cutting, trimming, floating, mounting of unstained tissue on slide and labelling of slide. Includes first unstained slide only.	2.6
62290	Paraffin and microtomy of first unstained slide only embedding by specimen grouping E** Includes embedding, rough cutting, trimming, floating, mounting of unstained tissue on slide and labelling of slide. Includes first unstained slide only.	3.1
62300	Plastic processing and embedding (e.g. Glycomethacrylate/methylmethacrylate)	11.0
62310	Plastic cut and mount – tissue (e.g. Glycomethacrylate/methylmethacrylate) For staining, please use the appropriate activity for staining (codes 62480-62500).	10.0
62320	Plastic cut and mount – bone (e.g. Glycomethacrylate/methylmethacrylate) For staining, please use the appropriate activity for staining (codes 62480-62500).	21.0
62330	Plastic – additional cuts only (e.g. Glycomethacrylate/methylmethacrylate)	3.0
62380	Auto embedding with uncomplicated microtomy (categories A, B, C above) Includes only the time to orient the tissue when required, rough	1.5

Code	Laboratory Activity	Unit Value
	cutting, trimming, floating, mounting of unstained tissue on slide and labelling of slide. Includes first unstained slide only.	
62390	Auto embedding with complicated microtomy (categories D, E above) Includes only the time to orient the tissue when required, rough cutting, trimming, floating, mounting of unstained tissue on slide and labelling of slide. Includes first unstained slide only.	2.2
62450	Microtomy of paraffin block – additional slide Includes cutting, floating, mounting of unstained tissue on slide and labelling of slide (with diamond pencil, marker or otherwise) – per slide. Note: use this activity for cutting and mounting of additional slides obtained from a block immediately after cutting the first slide (multiple levels), as well as for cutting and mounting additional slides from a block that has been previously stored.	1.0
62452	Adjustment of block to align block with knife. Includes only the time to align a previously stored block (or block that has been removed from the chuck for any reason) with the knife in order to cut the next slide and does not require rough cutting or trimming. Count once per block Use code 62450 for each slide cut.	0.7
62460	Giant section – whole mount Manual processing and embedding.	39.0
62470	Giant section – whole mount Cut, mount and label slide. For staining, please use the appropriate activity for staining (codes 62480-62500).	5.0
62471	Organize slides (pre-staining). (E.g. IHC, special stains, H&E staining) Count once per slide.	0.05
62472	Manual processing of slides to water Include the hands-on time to manually take a rack of slides from wax to water. Count once per slide.	0.05

Code	Laboratory Activity	Unit Value
62473	Manual processing of slides from water (or water based stain) to xylene Include the hands-on time to manually take a rack of slides from water or water-based stain to xylene Count once per slide.	0.1
62480	Staining – manual routine H&E or HPS Includes the time to load the rack, dipping and transferring through all stages of staining, unloading the rack and sorting of slides. Count once per slide or once per batch (E.g. 5 slides are stained in a batch, count the workload once only) Do not add automated staining codes 62490 or 62500 in addition to 62480.	0.25
62490	Staining – automated routine H&E or HPS Includes instrument programming, loading, monitoring, responding to alarms, unloading and transfer to coverslipper as well as the required washing and dehydration. Count once per slide.	0.1
62500	Staining – automated special stains including immunohistochemistry Includes clipping on the slide, instrument programming, loading, monitoring, responding to alarms, unloading and transfer to coverslipper as well as the required washing and dehydration. Count once per slide.	1.5
62510	Manual immunohistochemistry – enzyme digestion Count once per slide	1.0
62520	Manual immunohistochemistry – antigen retrieval Count once per slide.	1.0
62530	Manual immunohistochemistry – antigen blocking Count once per slide	1.0
62540	Manual immunohistochemistry – staining – direct Includes washes.	4.0

Code	Laboratory Activity	Unit Value
	Count once per slide.	
62550	Manual immunohistochemistry – staining – indirect Includes washes. Count once per slide.	5.0
62560	Manual counterstain for immunohistochemistry Count once per slide.	0.13
62570	Isolation of functional intact mitochondria (e.g. Muscle biopsy specimen for oxidative phosphorylation enzymology.) Includes weighing, manually slicing the specimen, placing in specially prepared tubes for homogenization, adding reagents, filtering, spinning and transferring the specimen. Do not count waiting time.	56
62600	Coverslipping – manual Includes the hands-on time for manually coverslipping (includes coverslipping, sorting and initial labelling of slides. Do not include any waiting time.) Count once per slide. For secondary labelling, also code 62651 or 62652.	0.4
62610	Coverslipping – semi-automated Includes the hands-on time to manually load and unload the coverslipper, sorting and initial labelling of slide. Do not include any waiting time. Count once per slide. (e.g. To calculate unit value per rack, multiply unit value x average number of slides/rack for each specific laboratory.) For secondary labelling, also code 62651 or 62652.	0.1
62630	Staining and coverslipping – full automation – H&E or HPS Full automation suggests that there is no manual intervention between the stainer and the coverslipper. The only time included is the loading, unloading and sorting of slides. Do not count activities codes 62480, 62500 and 62520 in conjunction with code 62540.	0.1

Code	Laboratory Activity	Unit Value
	Count once per slide. Do not add automated staining codes 62480 or 62490 in addition to 62630.	
62640	Staining and coverslipping – full automation – special stains or immunohistochemistry Full automation suggests that there is no manual intervention between the stainer and the coverslipper. The only hands-on time included is the loading, unloading and sorting of slides. Do not count activities codes 62480, 62500 and 62520 in conjunction with code 62540. Count once per slide. (e.g. To calculate unit value per rack, multiply unit value by the average number of slides/rack for each specific laboratory.)	1.25
62651	Secondary labelling—manual label • Applying a final pre-printed label Count this activity only if adding a secondary label after staining and coverslipping.	0.15
62652	Secondary labelling—manual marking • Manually labelling with a pen/pencil/marker Count this activity only if adding a secondary label after staining and coverslipping.	0.5
62662	Receipt and troubleshooting of a specimen for frozen section If the specimen is thereafter accessioned, count code 62000 separately.	1.3
62664	Gross assessment of specimen for frozen section Includes the assessment of the specimen and the selection of a representative tissue for frozen section. Capture this activity only if performed by unit-producing personnel (e.g. pathologist's assistant, MLT, morgue assistant). Exclude if this activity is performed by medical staff (e.g. pathologist, resident).	3.0
62666	Frozen section – first stained slide from each chuck Includes preparation of chuck, cutting, staining, mounting, coverslipping and disposition of frozen sample. Count once per chuck Includes initial labelling. For secondary labelling, also code 62651 or 62652.	5.8

Code	Laboratory Activity	Unit Value
62675	Frozen section – additional stained slides from the same chuck (e.g. levels) Includes cutting, staining, mounting and coverslipping. Count once per slide	2.0
62680	Frozen section – additional unstained section Includes cutting Count once per slide..	1.0
Special Stains		
62900	Acetylcholinesterase	19.3
62950	Acid Phosphatase	18.0
63000	Adenosine Triphosphate pH 4.3	6.1
63020	Adenosine Triphosphate pH 9.4	6.1
63050	Adenosine Triphosphate Reverse	18.5
63100	Alcian Blue - Magnesium Chloride	7.5
63200	Alcian Blue 3%	7.5
63225	Alcian Blue-Chlorantine Fast Red	9.0
63250	Alcian Blue Hyaluronidase	8.0

Code	Laboratory Activity	Unit Value
63300	Alcian Blue PAS – Haematoxylin	15.0
63350	Alcian Blue pH 1.0	7.0
63400	Alcian Blue pH 2.5	7.0
63450	Alcian Green	7.0
63500	Aldehyde Fuchsin	13.0
63550	Alizarin Red S	1.8
63600	Alkaline Congo Red	9.6
63620	Alkaline Phosphatase	19.6
63650	Auramine-Rhodamine	8.0
63700	Bensley Pinacyanoe Erythrosinate	5.5
63740	Bielchowsky – LFB	21.0
63750	Bielchowsky – PAS	21.0

Code	Laboratory Activity	Unit Value
63800	Bodian	15.0
63850	Bosma Steiner	21.0
63900	Brown and Brenn Modification of gram	4.8
63950	Brown-Hopps Modification of Gram	4.8
64000	Cajal's	21.0
64050	Chloroacetate Esterase	10.1
64100	Churukian Schenk	15.0
64150	Cresyl Echt Violet	4.0
64200	Cresyl Violet Acetate	4.0
64250	Crystal Violet	4.0
64300	Cytochrome Oxidase	20.0
64350	Diazo	10.0

Code	Laboratory Activity	Unit Value
64400	Dieterle	21.0
64450	Diff-quik Giemsa	4.0
64470	D.H. Tetrazolium	3.0
64500	Ethyl Green Pyronin	7.0
64550	Feulgen Reaction	15.0
64600	Fite	9.0
64650	Fontana-Masson	10.0
64660	Fontana-Masson- with bleach	13.0
64670	Foots (Reticulum)	12.0
64700	Glees and Marsland	28.0
64750	Goldner's One-step Trichrome	7.0
64800	Gomori Aldehyde Fuchsin	13.0

Code	Laboratory Activity	Unit Value
64900	Gomori Methenamine-silver	8.3
64950	Gomori One Step Trichrome	7.0
65000	Gomori Stain (Reticulum)	12.0
65050	Gordon and Sweets Stain (Reticulum)	12.0
65070	Gmelin	10.0
65100	Gram Stain (any method)	8.5
65150	Gridley	15.0
65200	Grimelius	15.0
65250	Grocott Methenamine – Sliver Nitrate (Fungus)	15.0
65300	Haematoxylin – Eosin- Manual For individual slides requiring either manual agitation or manual mixing. Count once per solitary slide or once per batch (e.g. if 5 slides are stained in a batch; count the workload once only) Do not add automated staining codes 62490 or 62500 in addition to 62480.	0.25
65350	Haematoxylin-Phloxine – Saffron	5.0

Code	Laboratory Activity	Unit Value
65370	Hales	15.0
65400	Hall (Fouchet)	10.0
65450	High Iron Diamine	7.0
65500	Holmes Silver Nitrate	28.0
65550	Holzer	28.0
65600	Hotchkiss-McManus PAS	12.7
65700	Jones Methenamine-silver	13.0
65750	Kinyoun	9.0
65770	Lendrum’s Pholoxine – Tartrazine	8.0
65800	Leuco Patent Blue	18.0
65850	Levaditi's	28.0
65900	Luxol Fast Blue	15.0

Code	Laboratory Activity	Unit Value
65950	Luxol Fast Blue - Cresyl Echt Violet	18.0
66000	Luxol Fast Blue - H&E	17.0
66050	Luxol Fast Blue - Holmes Silver Nitrate Method	18.0
66100	Malachite Green – Basic Fuchsin	16.0
66200	Mallory phosphotungstic Acid Hemaltoxylin (PTAH)	10.0
66250	Marchi's	18.0
66270	Martius Scarlet Blue	17.3
66300	Masson's Trichrome	15.0
66400	Mayer Mucicarmine	7.0
66500	Melanin Bleach - H&E (or any other counterstain)	4.0
66550	Methyl Blue	4.0
66600	Methyl Green – Pyronin Y	7.0

Code	Laboratory Activity	Unit Value
66650	Microwave Churukian – Schenk	11.3
66700	Microwave Fontana – Masson	9.0
66750	Microwave Methenamine – Silver Nitrate	13.0
66800	Microwave Modification of Bielschowsky	6.0
66850	Microwave Modification of Warthin Starry	13.0
66900	Microwave Rhodainine	15.3
66950	Microwave Steiner	14.0
67000	Microwave Ziehl-Neelson	14.0
67050	Modified Gomori	7.0
67100	Modified PTAH - H&E	18.0
67150	Modified Schmorl's	9.0
67200	Modified Toluidine Blue	13.8

Code	Laboratory Activity	Unit Value
67220	Movat's	18.0
67230	Mowry	16.0
67250	Muller-Mowry Colloidal Iron	12.6
67300	Myoadenylate Deaminase	22.0
67350	Nile Blue Sulphate	4.0
67400	Oil Red O	8.0
67450	Orcein Geimsa	8.0
67500	Osmium Tetroxide Paraffin Procedure for Fat	2.0
67550	PAS - Orange G	17.6
67600	Pascuals	TBD
67650	Periodic Acid Schiff (PAS)	7.0
67700	Periodic Acid Schiff with Diastase	11.0

Code	Laboratory Activity	Unit Value
67750	Periodic Acid Methenamine-Silver	14.0
67800	Phosphofructokinase	22.0
67850	Phosphorylase	TBD
67870	Pinacyanol Erythosin	26.0
67880	Potassium Permanganate – Amyloid	18.0
67900	Prolonged Ziehl-Neelsen	14.2
67950	Prussian Blue	4.5
68000	Rhodanine	10.2
68030	Romanowsky (e.g. Giemsa, Jenner Giemsa, May-Grunwald Giemsa)	7.0
68050	Russell Modification of Movat	10.0
68100	Schmorl Ferric-ferricyanide	4.3
68150	Sevier- Munger Modification of Bielschowsky	14.0

Code	Laboratory Activity	Unit Value
68200	Shikata (modified Orcein)	13.0
68250	Sirius Red	2.0
68300	Southgates Mucicarmine	7.0
68350	Steiner	18.0
68400	Succinic Dehydrogenase	18.0
68450	Sudan Black B	14.2
68500	Sudan IV	10.3
68550	Sulfamucin	TBD
68600	Thioflavin T	4.0
68650	Toluidine Blue	4.0
68670	TRIFF	TBD
68700	Turnbull Blue	7.0

Code	Laboratory Activity	Unit Value
68750	Unna-Pappenheim	10.0
68800	van Gieson Picric Acid-Acid Fuchsin	9.0
68850	Verhoeff	10.0
68900	von Kossa	10.0
68950	Warthin-Starry	15.0
68970	Weigert	10.0
69000	Weil Method	18.0
69020	Wilder (Reticulum)	12.0
69050	Ziehl-Neelson	8.0
69100	Ziehl-Neelson (AFIP Modification)	4.3
Miscellaneous		
69750	Review of case/specimens Includes the retrieval of tissue, preparation of tissue, washing and storing of tissues. Note: for retrieval of blocks or slides see code 69880. If a	8.0

Code	Laboratory Activity	Unit Value
	tissue needs to be re-embedded or a block needs to be re-trimmed and cut, use the appropriate codes above. Count once per case.	
69760	Manual sorting of slides and requisitions after processing Includes matching the requisition with the slides and manually assigning of the work to the pathologist. Count once per case.	1.3
69770	Nerve tease – neuropathology	150.0
69780	Nerve tease – neuropathology – additional teasing on the same slide	75.0
69800	Decalcification Includes immersing and removing the specimen/tissue from the decalcification fluid. Count once per cassette for the initial immersion, and once each day the specimen is checked or the fluid is changed thereafter.	1.0
69810	Decalcification with chemical test for endpoint	2.0
69815	X-ray test for endpoint of decalcification Includes the time to remove the tissues from the decalcifying agent, arranging the tissues/cassettes and setting up the x-ray, assessing the x-ray and tissues for endpoint or further decalcification and sorting of tissue/cassettes. Count once per x-ray regardless of the number of tissues/cassettes.	21.0
69850	Bone morphometry – includes preparation, data acquisition (fluorescent data), image acquisition and manipulation of the digital image Count once per case.	100.0
69880	Retrieving slides or blocks from files Capture this activity only when retrieving blocks or slides from the permanent (or long term) filing system of the laboratory.	6.0

Code	Laboratory Activity	Unit Value
	Includes re-filing of the blocks/slides. Count once per case.	
69890	Filing block or slides Capture this activity only if filing blocks or slides in the permanent (or long term) filing system of the laboratory. Count once per slide or block.	1.0
69900	Assistance with renal biopsy collection	1.5
69910	Assistance for bone marrow biopsy collection (see hematology)	Refer to the hematology, bone marrow section
69920	Additional clearing of lymph nodes	5.0

Cytopathology

This section includes a list of activities commonly performed in a cytopathology laboratory that pertain to the preparation and microscopic examination of exfoliated cells and cellular specimens collected from various body organs or tissues. Activities are grouped and presented under seven headings that include:

- Pre Analytical Activities
- Staining
- Gynecology
  - Screening of Slides
  - Liquid Based Cytology
- Non-Gynecology
  - Pre-Treatment
  - Liquid Based Cytology
  - Screening of Slides
- Fine Needle Aspiration
- Miscellaneous

Any activity in this list can be utilized by any clinical laboratory functional centre if the unit value is accurate and reflective of the realistic average time required to perform a specified activity.

Recording Instructions

1. Unit values for aggregated activities:
   Unit values for aggregated activities may be used for some activities in the cytopathology section. For example, if the organization always processes pap smears to include receipt/triage (code 70100), clinical history lookup (code 70120), manual staining (code 70200), manual coverslipping (code 70240) and manual sorting of requisitions (code 70280), the laboratory may choose to associate the workload with each pap smear as follows:

70100 – Receipt/triage	1.7
70120 – Clinical history	0.4
70200 – Manual staining	0.2
70240 – Manual coverslipping	0.4
70280 – Manual sorting of requisitions	0.3
Combined workload unit for each pap smear preparation:	**3.0**

2. Relative unit values for occasional activities
   Relative unit values for occasional activities may be used for some activities in the cytopathology section. For example, an organization may choose to develop an aggregate value for reading pap smears that will include a number of occasional activities. An audit is performed to determine the frequency of each of the activities.

   The audit shows:
   70300 Screening 1st read – normal (90% of all pap smears)
   70320 Screening 1st read – abnormal (10% of all pap smears)
   70340 Complete Rescreen Random (10% of all pap smears)
   70360 Complete Rescreen Targeted (6% of all pap smears)
   70380 Rapid Rescreen (50% of all pap smears)

   The organization can choose to develop an aggregate value for each pap smear as follows:

Code	Activity	Frequency		Unit value for one activity	Proportion of unit value
70300	Screening 1st read normal	90%	x	6.4	5.76
70320	Screening 1st read abnormal	10%	x	8.2	0.82
70340	Complete rescreen random	10%	x	4.2	0.42

70360	Complete rescreen targeted	6%	x	5.1	0.3
70380	Rapid rescreen	50%	x	2.5	1.25
Aggregate workload unit for each pap smear screened:					**8.55**

As such, an aggregate value of 8.55 workload units may be assigned to each pap smear for these activities.

When using aggregate values, it is important to re-evaluate the percentages used on a regular basis or when the service changes significantly.

Code	Laboratory Activity	Unit Value
Pre Analytical Activities		
70100	Receipt/triage/logging-in/accessioning of specimen for cytopathology assessment Includes separating out containers, recording date and time of receipt and initials of unit-producing personnel receiving the specimens, matching the containers to the requisitions, assessing the quality of the specimens, prioritizing and sorting by specimen complexity and urgency, accessioning the specimen by assigning a number into the LIS or logging it manually and sorting the specimens numerically. Count once per specimen.	1.7
70120	Clinical history – manual or electronic lookup Includes accessing and reviewing the chart and any relevant documentation. Include only if performed by unit-producing personnel from the laboratory. Count once per service recipient history (regardless of the number of cases for that service recipient).	0.4
Staining		
70200	Conventional manual staining – per slide Includes loading the rack, fixing the slide, moving the basket through each solution, checking for staining adequacy and removing slides from the rack.	0.2
70220	Automated staining – per slide Includes loading the rack, loading and programming the instrument with the rack and unloading the rack from the instrument.	0.05
70231	Manual labelling of slide- with pre-printed label	0.15

Code	Laboratory Activity	Unit Value
70235	Manual labelling of slide- with pencil/pen/marker	0.5
70240	Manual coverslipping – per slide Includes coverslipping the slide, verifying the quality of the coverslipping, placing the slide on a heater for drying and placing the slide on a tray for screening.	0.4
70260	Automated coverslipping – per slide Includes loading the rack, loading the instrument with the rack and unloading the rack from the instrument, verifying the quality of the coverslipping and placing the slide on a tray for screening. Note that troubleshooting of coverslipper is included in non-service recipient activity 02230. For the purposes of a coverslipper, it is recommended that an audit be performed to determine the average daily time spent troubleshooting the instrument, and a daily unit value be assigned. It is important to review this time periodically and every time a major modification is made to the coverslipper.	0.1
70280	Manual sorting of requisitions and specimens and manually or electronically assigning workload after processing Includes matching the requisition with the specimen and manually or electronically assigning workload to the primary screener or pathologist. Count once per case. Refer to activity codes 70120 for clinical history lookups.	0.3
Gynecology		
Screening of Slide		
70300	Screening – 1st read – normal specimen – per slide Includes unsatisfactory specimens.	6.4
70320	Screening – 1st read – abnormal specimen – per slide	8.2
70340	Complete rescreen – random – per slide Includes rescreening of randomly selected normal specimens only. Involves rescreening by a second unit-producing personnel reviewing the slides/previous results from the 1st read on normal specimens. Includes reviewing the complete slide.	4.2
70360	Complete rescreen – targeted – per slide	5.1

Code	Laboratory Activity	Unit Value
	Includes selecting and reviewing normal specimens from previous 1st read with high risk histories. May also include reviewing the slides from the 1st read with abnormal results. Includes reviewing the complete slide.	
70380	Rapid rescreen – per slide Applies to any gynecological slide that has a limited number of random fields reviewed.	2.5
70390	Imaging system – screening with emphasis on questionable cells	7.3
70400	Cytohormonal evaluation The evaluation is expressed as a quantitative index after counting 100 cells.	4.6
70420	Slide maintenance Includes slide retrieval, removal of the coverslip, repair of broken slides and destaining. See appropriate staining and coverslipping activities when restaining (if required) or re-coverslipping (if required).	1.8
70440	Documentation for follow-up of an abnormal pap smear Includes the time required to determine follow-up strategies, to manually prepare and issue written communication related to follow up of an abnormal pap smear (e.g. verifying if an appropriate specimen has already been submitted for follow-up). To be used only if performed by unit-producing personnel of the laboratory, and only if the process is not managed by a central/provincial registry. Exclude if the process is performed automatically by an electronic system without manual intervention.	4.2
Liquid Based Cytology		
70460	Cytyc – thin prep Includes only the processing steps from the receipt of the vial to the generation of the slide. Capture the clinical history, accessioning and staining separately. Count once per slide.	2.6
70480	Surepath with or without stainer Includes only the processing steps from receipt of the vial to the generation of a stained or unstained slide.	4.0

Code	Laboratory Activity	Unit Value
	Capture the clinical history, accessioning and staining separately.	
Non-Gynecology		
Pre-Treatment		
71000	Fluid – preparation by membrane filter Count once per slide.	2.9
71020	Fluid – preparation by centrifugation – includes the first centrifuging Count once per specimen.	1.7
71030	Fluid – preparation by centrifugation – each subsequent centrifugation after the 1st centrifugation Count once per specimen.	0.9
71040	Fluid – preparation by cytospin Count once per specimen.	1.8
71060	Sputum Liquefaction	1.5
71070	Pick and smear technique for sputum and other mucoid material Count once per slide.	1.4
71090	Lysing of red cells on a direct smear (non-gynecological)	0.4
71100	Preparation of cell block Includes adding a gelling agent, incubating, resuspending the sediment, applying the suspension to the tissue paper or tissue bag, loading the cassette and dispatching the cassette to histology.	1.4
71110	Wet prep – includes the preparation of a wet preparation Note that the centrifugation, supernatant removal, and re-suspension of cells are already included in the general slide preparation. Add this unit value for the time required to prepare a wet prep in addition to the slide preparation.	0.2
71120	Diff Quick staining- semi-automated Includes manual loading slides in the racks then onto the machine, agitating the racks and transferring and placing onto coverslipper. Count once per slide.	0.5

Code	Laboratory Activity	Unit Value
Liquid Based Cytology		
71200	Cytyc (Hologic) – thin prep Includes vortexing, 1st centrifugation and wash to the generation of the slide. Count once per slide.	3.6
71220	Cytyc (Hologic) – thin prep – extra centrifugation and/or extra wash after the initial 1st centrifugation	1.0
71240	SurePath with or without stainer	2.6
Screening of Slides		
71420	Screening of slide for malignancy or for other non-neoplastic entities (e.g. microorganisms or crystals) using a routine stain (PAP/H&E/Diff Quick) or unstained air dried/wet mount Does not include a review of the slide for adequacy check. Count once per slide.	5.0
71440	Screening of slide using a special stain e.g. fungal, silver, ZN If the cytotechnologist is performing the special stain, refer to the anatomical pathology section in the schedule of unit values for workload units. Count once per slide.	3.3
71460	Bronchial lavage – differential cell count Includes differentiating up to 500 cells on a bronchial lavage or other similar fluid as well as screening for neoplasms or other abnormalities.	4.9
Fine Needle Aspirations (FNAs)		
72000	FNA – bedside or medical imaging assisted Includes preparations of materials, greeting and identification of service recipient, receipt of specimen from the clinician and preparation of direct smear. Count once per pass. Count 3.2 for first pass. Add 1 additional unit for subsequent passes. Note: if separate passes are performed for purposes other than cytopathology (e.g. microbiology, flow cytometry, anatomical pathology, count this unit value for each pass).	3.2 1.0
72020	FNA – bedside or medical imaging assisted – staining of slide	2.0

Code	Laboratory Activity	Unit Value
	(e.g. Diff Quick, rapid H&E or rapid Pap stain). Includes staining adequacy check. Count once per slide.	
Miscellaneous		
75910	Result entry- Gynecological specimens Count once per requisition or test order – each time a result/edit is entered. If a new order is added, use code 11600.	0.5
75921	Result entry- Non-gynecological specimens Count once per requisition or test order – each time a result/edit is entered. If a new order is added, use code 11600.	1.0
76001	Slide retrieval for review Includes locating and retrieving of the slide from storage if performed by unit-producing personnel (count the reading and reporting, as required, separately).	1.3
76002	Specimen retrieval for repeat preparation Includes locating and retrieving of the specimen for repeat preparation if performed by unit-producing personnel (count the preparation of the specimen separately).	1.3
76020	Accessing sample request for permission to release material to another facility: Include those activities that are required below, if performed by unit-producing personnel: Logging- Electronic or manual- destination of slide, slide ID number and date, packaging and mailing. Retrieval of the slide- verify slide accession number, locate the slide and insert a memo to document removal of the slide if required. Documentation of consent- written permission by MD or service recipient to send the slide elsewhere. Interpretation of report- review the slide or blocks to verify the specimen is appropriate to fulfill the request. Send returning facility's opinion to the first Pathologist (scan their report onto the original report).	5.0 1.3 1.8 2.5 1.0

Code	Laboratory Activity	Unit Value
76030	Return Process Dealing with returned slides- steps to ensure slides were returned in good order, replaced and documented in appropriate manner. Only count if performed by unit-producing personnel.	1.3
76040	Retrieving and filing slides for review of findings. Capture this activity when retrieval and filing of the slide is done for a particular individual service recipient for the purpose of reviewing the findings to inform the current diagnostic assessment or issue an addendum report. Retrieving and filing of slides for education or quality assurance is considered a non-service recipient activity. Only count if performed by unit producing personnel.	1.0

Electron Microscopy

This section includes a list of activities commonly performed in an electron microscopy laboratory that pertain to the preparation and examination of body tissues and other cellular material using an electron microscope.

Any activity in this list can be utilized by any clinical laboratory functional centre if the unit value is accurate and reflective of the realistic average time required to perform a specified activity.

Recording Instructions

1. Unit values for aggregated activities:
   Unit values for aggregated activities may be used for some activities in the electron microscopy section. For example, if the collection of a kidney biopsy always includes the involvement of unit-producing personnel in the coordination of the biopsy (code 96060), biopsy procurement – basic (code 96090), biopsy procurement-kidney (code 96120) and stereo microscope observation (code 96180), the laboratory may choose to associate the workload with each kidney biopsy procurement as follows:

96060 – Coordination of biopsy	1.0	
96090 – Biopsy procurement – basic	7.0	
96120 – Biopsy procurement - kidney	2.5	
96180 – Stereo microscope observation	5.0	
Combined workload unit for each kidney biopsy procurement:		**15.5**

2. Relative unit values for occasional activities

Relative unit values for occasional activities may be used for some activities in the electron microscopy section. For example, an organization may choose to develop an aggregate value for thin sectioning will include occasional sectioning of 4 grids, 8 grids and 12 grids. An audit is performed on thin sectioning and the audit demonstrates that 50% of specimens have only 4 grids sectioned (code 96360) 30% of specimens have 8 grids sectioned and 20% of specimens have 12 grids sectioned.

The organization can choose to develop an aggregate value for thin sectioning of all specimens as follows:

# Grids	Code	Workload Units	Frequency	Proportional Workload Units
4 grids	96360	15.0 = 15.0	50%	7.5
8 grids	96360 + (96390 x 1)	15.0 + 10.0 = 25.0	30%	7.5
12 grids	96360 + (96390 x 2)	15.0 + 20.0 =35.0	20%	7.0
Aggregate workload unit for thin sectioning:				**22.0**

As such, an aggregate value of 22.0 workload units may be assigned to every specimen for the activity of thin sectioning.

When using relative values for occasional activities, it is important to re-evaluate the percentages used on a regular basis or when the service changes significantly.

Code	Laboratory Activity	Unit Value
96000	Preparation of kits for external uses See pre/post analysis activities codes 12090 and 12120.	Refer to the pre/post analysis section
96030	Deparaffinization - manual Includes the time to process a tissue from paraffin to glutaraldehyde. Count once per tissue processed.	7.0
96060	Coordination of biopsy Includes the time required to coordinate the procurement of a biopsy specimen. Count only if the coordination is required to attend the location where the biopsy will be performed. Count once per biopsy.	1.0
96090	Biopsy procurement – basic	7.0

Code	Laboratory Activity	Unit Value
	Includes the hands-on time required to prepare the cart and materials, receive specimen and aliquot the specimen to multiple areas. Count once per specimen type.	
96120	Biopsy procurement – kidney Collect only if attending the location where the biopsy is being performed (collect travel time separately as non-service recipient workload) in addition to code 96090 above. Includes the hands-on time required to receive and observe the biopsy to render an opinion about the suitability of the specimen. Does not include any waiting time. Count once per core observed and opinion rendered.	2.5
96180	Stereo microscope observation (dissection microscope) Includes the time required to observe the specimen using a dissecting microscope, orient and/or dissect/mince the biopsy. Count once per specimen type.	5.0
96200	Density gradient isolation of monocytes – per 10 mls of whole blood e.g. Ficoll Hypaque or Percoll Includes layering of cells and washing.	13.0
96210	Processing for EM – manual Includes the hands-on time required to move a specimen from glutaraldehyde through osmium tetroxide, water, alcohol/acetone, as required, to the final resin stage. Also includes the trimming and orientation required. Count once per specimen type.	8.0
96230	Processing for EM – partial manual/automated Includes the hands-on time required to move a specimen from glutaraldehyde through osmium tetroxide, alcohol, uranyl acetate as required, and loading onto an automated processor for final moving through to the final resin stage. Also includes the trimming and orientation required. Count once per specimen type.	5.6
96240	Processing for EM – automated	2.0

Code	Laboratory Activity	Unit Value
	Includes the hands-on time required to document, wrap specimen, place specimen in and remove it from an automated processor. Also includes the trimming and orientation required. Count once per specimen type.	
96250	Specimen processed from a glass slide for electron microscopy	Actual or Standard Time
96255	Whole mount preparation for transmission electron microscopy Count once per specimen	9.0
96270	Resin embedding Includes the time to place and orient a specimen in a capsule/mold, label the specimen, polymerize the block(s) and remove it from the capsule/mold. Count once per block.	2.0
96300	Thick sectioning and toluidine blue staining Includes trimming the block, orienting the block, trimming the face, filling the boat, setting the knife and staining the slide with toluidine blue or similar stain and coverslipping. Count once per slide.	7.0
96330	Assess toluidine blue Includes the time to assess the slide stained with toluidine blue or similar stain for appropriateness of section. Count once per slide.	1.0
96360	Thin sectioning – first 4 grids Includes trimming block, filling boat, orienting block in chuck, setting knife, cutting block, preparing grid, placing sections on grid and drying grid. Includes up to 4 grids.	15.0
96390	Thin sectioning – extra grids (> 4 grids) Includes cutting block, preparing grid, placing sections on grid and drying grid. Count once for every subsequent 4 grids.	10.0
96400	Cryoultramicrotomy	16.1

Code	Laboratory Activity	Unit Value
	Includes flash freezing and sectioning.	
96420	Staining for EM – manual Includes staining with uranyl acetate (or similar negative stain), other additives such as lead citrate, rinsing and blotting. Count once per grid stained.	3.0
96450	Staining for EM – automated Includes loading, program selection and unloading of automated EM stainer. Count once per grid stained.	0.1
96452	Gold coating of specimen for scanning electron microscopy (SEM)	3.0
96454	Carbon coating of specimen for scanning electron microscopy (SEM)	3.6
96456	Critical point drying of specimen for scanning electron microscopy (SEM)	7.0
96458	Mounting of specimen onto stub for scanning electron microscopy (SEM)	8.6
96460	Loading scope (transmission electron microscope) – loading and unloading with specimen and liquid nitrogen	1.0
96480	Scoping – anatomical pathology Includes screening the specimen, consulting with medical personnel, and reviewing the image. Include only if performed by unit-producing personnel	Actual or Standard Time
96510	Scoping – virology Includes, screening the specimen, consulting with medical personnel, reviewing, adjusting and photographing the specimen performed by unit-producing personnel. Count once per specimen. Include only if performed by unit producing personnel.	10.0
96520	Histogram generation for electron microscopy	Actual or Standard Time
96540	Film photography Includes developing and printing a film-based photograph.	7.0

Code	Laboratory Activity	Unit Value
	Count once per image printed.	
96560	Film/Digital photography Includes loading and unloading of negative, developing the negative, scanning and optimizing the image to a digital format. Count once per image photographed.	7.0
96570	Digital photography Includes the optimization and electronic manipulation of the image. Count once per image saved.	2.0
96580	Burning of digital image(s) or file to CD/printing of an image. Includes creation of appropriate folder and transfer of file to the storage media or to printer. Count once per case.	1.0
96582	Elemental mapping of specimen by electron microscope analysis (EMA)	Actual or Standard Time
96584	Static Probe of specimen by electron microscope analysis (EMA)	Actual or Standard Time
96586	Count of cilia inner and outer by transmission electron microscopy (TEM)	Actual or Standard Time
96588	Count of platelet granules by transmission electron microscopy (TEM)	Actual or Standard Time
96590	Measuring the Glomerular Basement Membrane – digital automated method	0.5
96595	Measuring the Glomerular Basement Membrane – manual method Measuring from the developed negatives	11.0
96600	Archiving of specimen (blocks) Count once per specimen.	1.0
96630	Archive photograph (film or digital)	1.0

Code	Laboratory Activity	Unit Value
	Includes transfer of electronic file to server or film negative to appropriate envelopes. Count once per photograph.	

Clinical Microbiology

This section includes a list of activities commonly performed in a clinical microbiology laboratory that pertain to the identification of the causative agents of infectious diseases, of the service recipient's susceptibility and resistance to antimicrobials, and the effect of drugs on the causative agent.

Activities are grouped and presented under twelve headings that include:

- Specimen Preparation and Handling
- Microscopy
  - Smear Preparation
  - Smear Examination
- Microbiological Culture
- Blood Culture
- Microbiological Identification
- Susceptibility Testing
- Mycology
- Parasitology Identification
- Virology
- Serology
- Molecular Microbiology
- Miscellaneous

Any activity in this list can be utilized by any clinical laboratory functional centre if the unit value is accurate and reflective of the realistic average time required to perform a specified activity.

Recording Instructions

1. Labelling of slides, subcultures etc. (e.g. plate, bottle, tube or slide [PBTS]) is included in the existing code definitions for the clinical microbiology section.

2. Unit values for aggregated activities:

   Example #1

   Unit values for aggregated activities may be used for some activities in the clinical microbiology section. For example, if every eye swab received always includes

acknowledging receipt of the specimen in clinical microbiology (code 50010), the preparation of a gram smear (code 51000), manual staining of a gram smear (code 50460), gram smear examination (code 50700), inoculation on a two plates (code 51000) and manual streaking of each plate (code 51020), the organization may choose to assign a combined workload unit to each eye swab specimen received as follows:

50010 – Acknowledge specimen	0.6
51000 – Inoculate specimen on PBTS (gram smear)	0.2
50460 – Gram smear staining	0.7
50700 – Examine gram smear	4.1
51000 – Inoculate specimen on PBTS (culture plate)(0.2 x 2)	0.4
51020 – Manual streaking of plate (0.5 x 2)	1.0
Combined workload units for each eye swab:	**7.0**

In this case, the organization can assign 7.0 workload units for each eye swab received in addition to the appropriate workload units for reading the plates afterwards.

Example #2

Workload units for water testing (e.g. a Colilert system) for each specimen could potentially require a combination of any of the following codes depending on certain laboratory configurations and procedures:

50010 – Acknowledge receipt in clinical microbiology	0.6	
50060 – Centrifugation		1.4
56020 – Drinking water – set up and read culture (Includes a colony count)	1.2	
56120 – Validation of results	0.4	
56140 – Manual transfer of reportable results	0.5	
50160 – Filtration	2.5	
Combined workload units for each sample:		**6.6**

In this case, the organization can assign 6.6 workload units for each water sample received and tested (in this example, using a Colilert protocol) .

3. Relative unit values for occasional activities

   Relative unit values for occasional activities may be used for some activities in the clinical microbiology section. For example, an organization may choose to develop an aggregate value for receiving and planting a catheter tip that includes acknowledging receipt of the specimen in clinical microbiology (code 50010), the inoculation of the specimen on PBTS for gram smear (code 51000), manual staining of a gram smear (code 50460), gram smear examination (code 50700), inoculation of the specimen on PBTS (three culture plates) (code 51000) and manual streaking of each plate (code

51020) as well as the occasional improperly submitted catheter tip. An audit demonstrates that 10% of catheter tips are submitted improperly and require the extra handling referred in code 50220. The organization can then develop an aggregate workload unit as follows:

50010 – Acknowledge specimen	0.6
51000 – Inoculate specimen on PTBS (gram smear)	0.2
50460 – Gram smear staining	0.7
50700 – Examine gram smear	4.1
51000 – Inoculate specimen on PTBS (three culture plates) (x3)	0.6
51020 – Manual streaking of plate (x3)	1.5
50220 – Improperly submitted specimen (10% x 3.0)	0.3
Aggregate workload unit for each catheter tip:	**8.0**

When using relative values for occasional activities, it is important to re-evaluate the percentages used on a regular basis or when the service changes significantly.

4. Deconstructed workload units:
   A deconstructed workload can be used for some activities in the microbiology section. For example, the non-service recipient activity, special atmospheric jar/bag with gaspack (code 02293), is assigned 1.1 workload units per jar/bag. If the organization wishes to collect the workload for each plate that is incubated in the jar/bag, they will conduct an audit (retrospective or prospective) to determine the average number of plates per jar/bag, and then assign the appropriate workload unit to each plate. Assume that an audit determines that, on average, 10 plates are incubated in each jar/bag. The deconstructed workload is then calculated as follows:

   $$\frac{\text{Workload unit per jar/bag}}{\text{Number of plates per jar/bag}} = \text{workload unit per plate}$$

   $$\frac{1.1}{10} = 0.11 \text{ workload units per plate}$$

   When using deconstructed values, it is important to re-evaluate the proportions used on a regular basis or when the service changes significantly.

5. Daily workload assignment
   Daily workload assignment can be used for some activities in the clinical microbiology section. For example, assume that an audit of the non-service recipient activity ‘special atmospheric jar/bag with gaspack’ (code 02293) is undertaken, and an organization determines that 30 special atmospheric jarsbags are set up daily.

   Total daily workload for activity 02293: 30 x 1.1 = 33.0

When using daily values, it is important to re-evaluate the percentages used on a regular basis or when the service changes significantly.

6. Chlamydia culture or viral culture by shell vial technique

For Chlamydia culture or for viral culture by shell vial technique that may include the following steps, collect the workload associated with the individual steps.

Step	Description	Code
1	Centrifugation	50060
2	Inoculate culture	51000
3	Inoculate slide	51000
4	Perform fluorescent stain	50540
5	Examine fluorescent stain from culture	50880

Code	Laboratory Activity	Unit Value
Specimen Handling and Preparation		
50010	Acknowledge receipt in clinical microbiology Includes matching of the specimen type, verification of the appropriateness of testing order and site of specimen, appropriate labelling of Plate/Bottle/Tube/Slide (PBTS). Note: if a specimen is not accessioned in a specialized receiving area and only accessioned in microbiology, also count 10500 for the accessioning activity.	0.6
50020	Liquefaction (e.g. mucolyse)	0.4
50040	Heat inactivation Include this only when it is not part of the kit methodology recommended by the manufacturer.	0.6
50060	Centrifugation, decanting and reconstitution Include this only when it is not part of the kit methodology recommended by the manufacturer.	1.4
50080	Tissue grinding Includes cutting of tissue required prior to grinding. Includes addition of fluid to facilitate the grinding. Do not capture if using code 50280.	5.0
50100	Single dilution Use only for additional dilutions, beyond the usual number associated with an activity, or for additional dilutions required in order to prepare a titration.	0.5

Code	Laboratory Activity	Unit Value
	Count once per series of dilutions.	
50140	Sonication	5.0
50160	Filtration (any body fluid sample e.g. urine, CSF) Include this only when it is not part of the kit methodology recommended by the manufacturer e.g. Millipore filter for water testing.	2.5
50180	Formalin kill Includes addition of the solution to a specimen by aliquotting or by adding to filter paper.	0.9
50220	Manipulation of improperly submitted specimen (e.g. aseptically separating tip from the catheter)	3.0
50260	Manipulation of blood bag and/or dialysis bag	2.5
50280	Aliquotting of specimen (e.g. CSF, cutting of tissue) Includes dividing/aliquotting of specimen for distribution to other laboratory sections.	0.9
50290	Isolation of functional intact mitochondria Includes weighing the specimen (net weight), manually slicing, transfer to tubes prepared for homogenization, adding reagents, filtering, spinning then transfer of specimen to microtubes.	56.0
Microscopy (gram smear, wet prep, other stains including fluorescence and immunofluorescence)		
In the clinical microbiology section, the following definitions are applied: Slide – *refers to the individual glass (or other material) slide upon which material from one or more specimens is placed in order to stain and/or view under a microscope. A slide may hold one or more specimen smears or wells.* Smear – *the material from a single specimen that is placed on a slide. A single slide may hold one or more smears.*		
Smear Preparation		
	For the preparation of a simple smear (for any stain) or wet prep, please refer to code 51000 – Inoculate For the preparation of a layered gram smear, count the workload units for code 51000 for each layer prepared.	Refer to the microbiological culture section
50420	Prepare gram smear – cytospin	2.2
50460	Stain gram smear – manual	0.7

Code	Laboratory Activity	Unit Value
	Count once per slide	
50480	Stain gram smear – automated Count once per slide	0.5
50500	Perform Ziehl-Nielsen stain – hot Includes staining of the slide. Count once per slide	3.5
50520	Perform Ziehl-Nielsen stain – cold (modified Kinyoun's stain) Includes staining of the slide. Count once per slide	0.5
50530	Modified Hematoxylin Kinyoun Counterstain Count once per slide.	1.2
50540	Perform fluorescent stain (e.g. Auromine O, Acridine Orange) Count once per slide	0.7
50560	Perform direct immunofluorescent stain Count once per slide	1.6
50580	Perform indirect immunofluorescent stain Count once per slide	2.0
50600	Perform spore stain Includes the time to stain the slide. Count once per slide	1.5
50610	Weber stain	3.0
50620	Perform special stain – see unit values in the anatomical pathology section	Refer to the anatomical pathology section
Smear Examination		
50700	Examine gram smear – direct smear of sterile specimen (e.g. CSF, blood, synovial fluid) Includes close review of entire slide to determine presence/absence of organisms. Count once for up to 40 fields examined.	4.1

Code	Laboratory Activity	Unit Value
50720	Examine gram smear – direct smear of non-sterile specimen (e.g. sputum, genital swab, bacterial vaginosis) Count once per smear	2.7
50740	Examine gram smear – from culture plate for morphology Count once per smear	0.3
50780	Search wet preparation for Trichomonas directly from a specimen and/or culture.	2.8
50790	Search wet preparation for yeast directly from a specimen and/or colony.	0.8
50820	Examine Ziehl-Nielsen smear – direct from specimen Count once per smear	10.0
50840	Examine Ziehl-Nielsen smear – from culture Count once per smear	3.0
50860	Examine fluorescent stain prepared from a direct specimen May include a fluorescent stain (e.g. Acridine Orange) or a direct or indirect immunofluorescent stain. Count once per smear/well/circle	1.6
50880	Examine fluorescent stain prepared from a culture May include a fluorescent stain (e.g. Acridine Orange) or a direct or indirect immunofluorescent stain. Count once per smear/well	1.3
50900	Examine methylene blue stain prepared from a direct specimen	1.6
Microbiological Culture		
51000	Inoculate (plant) specimen on plate/bottle/tube/slide (PBTS) Includes the inoculation of any smear for any stain (e.g. gram smear inoculation, fluorescent stain inoculation) and the inoculation (preparation) of a wet prep. Count once per PBTS. For example, if planting 3 plates for a specimen, count 0.6 workload units. Note: if planting two or more specimens on a single PBTS, count one PBTS for each specimen.	0.2
51020	Streaking – manual (streaking means using a sterile device to	0.5

Code	Laboratory Activity	Unit Value
	spread the initial inoculum in order to grow isolated colonies.) Includes placing a staph streak/disk when required. Includes placing the plates in an incubator/jar. Count once per plate.	
51040	Streaking – automated Includes loading and unloading, sorting and placing the plates in an incubator. Also includes placing a staph streak/disk when required. For anaerobic incubation, refer to the appropriate anaerobic incubation activity in addition to this activity. Count once per plate.	0.1
51300	First reading culture (count once per PBT) Includes removing the PBT from the incubator, sorting and combining the PBT appropriately, reviewing, analyzing and consulting about the growth and recording the observation. Estimating colony counts on blood, urine and/or catheter tips: use code 51300. Count once per PBT. For example, for blood, chocolate & McConkey, count 1.2 workload units. For all subsequent reads of culture, see code 51360. Note: The unit value for code 51300 is an average of all of findings, both positive and negative. The unit value average is therefore driven down by the significant proportion of 'no growth' culture readings. The unit value of 0.8 for Code 51320 (sub-culture reading) would not result in a 'no growth' finding; therefore the average time is not reduced proportionally.	0.4
51310	Read culture or test under a UV light	0.4
51320	Prepare subculture Includes the time to pick an isolated colony from the original PBT, inoculate and staph streak on a second PBT, and incubate the PBT. Also includes the dropping of chemical or antibiotic discs for bacterial identification when required. Note: The unit value for code 51300 is an average of all of findings, both positive and negative. The unit value average is therefore driven down by the significant proportion of 'no growth' culture readings. The unit value of 0.8 for Code 51320 (sub-culture reading) would not result in a 'no growth' finding; therefore the average time is not reduced proportionally.	0.8

Code	Laboratory Activity	Unit Value
51340	Read a subculture Includes removing the PBT from the incubator, sorting and combining the PBT appropriately, reviewing, analyzing and consulting about the growth and recording the observation. Count once per PBT	0.8
51360	Subsequent reading of PBT – after an additional phase of incubation. Includes removing the PBT from the incubator, sorting and combining the PBT appropriately, reviewing, analyzing and consulting about the growth.	0.4
51380	Urine screening – auto (e.g. Quickicult) Includes all the pipetting steps, loading and programming of the instrument, reading of the result, discarding of the specimen.	4.5
Blood Culture		
51495	Volume check of blood culture bottle Use this ONLY if the volume of blood to broth needs to be measured/calculated before incubation. When a formal volume assessment of broth prior to sample collection is required (e.g. calculate the vacuum stop requirements), see code 02293 in the non-service recipient section.	0.2
51520	Blood culture – auto – manual data entry into the automated system Includes loading the incubator with the bottle.	0.5
51540	Blood culture – auto – barcoded data entry into the automated system Includes loading the incubator with the bottle.	0.2
51550	Blood culture – visual examination of bottle after incubation, in the absence of automation. Count once per bottle.	0.2
51600	Blood culture – auto – respond to notification of positive cultures and unload the incubator Includes removal of the positive or negative bottle from the incubator.	0.2
Microbiological Identification		

Code	Laboratory Activity	Unit Value
52000	Rapid ID (identification) test (e.g. oxidase, catalase, bile solubility, slide coagulase)	0.5
52020	Conventional tube methods Includes addition of reagents and/or reading of tube (e.g. coagulase, TSI, urea, hippurate, porphyrin). Also includes the inoculation, incubation (if required) and the reading of the tube.	1.0
52040	Biochemical plate/media method (e.g. DNase, Camp test, reverse camp test, egg yolk agar, TSI) Also includes the inoculation, incubation (if required) and the reading of the plate.	1.0
52060	Replicator method Unit value = (1 x # organisms) + (# plates x 1). Capture the dilution to a McFarland standard separately.	As indicated
	Manual Commercial ID system Includes the preparation of suspension to a particular McFarland standard, inoculation and reading and interpretation. For the inoculation of a purity plate, use code 51020. For the read of a purity plate, use code 51300.	
52081	Collect 6.0 workload units for the first set of individual pipetting activities for all the wells (e.g. pipetting the suspension into each individual well). If the wells are inoculated by pouring the suspension into the card (e.g. e.g. RapID®ANA), then the first set of pipetting activities refers to pipetting reagents/oil whether pre or post incubation. Also includes the first reading of the strip.	6.0
52082	Collect 3.0 workload units for additional pipetting steps (e.g. adding reagent or oil to the majority of the wells after code 56081)	3.0
52083	Collect 3.0 workload units if the results of the first incubation indicates a re-incubation, re-read and re-interpretation is required	3.0
52084	Collect 1.0 workload units if analysis requires accessing an external database (e.g. manufacturer's website or if using code book.) Include only when performed by unit-producing personnel.	1.0

Code	Laboratory Activity	Unit Value
52120	Automated microorganism identification and/or susceptibility Include all steps required to perform an identification using an automated instrument. Steps may include preparing a saline suspension to a particular McFarland standard, inoculating, identifying and loading the card as well as reviewing, unloading and disposing of the card(s). For the inoculation of a purity plate, use code 51020. For the read of a purity plate, use code 51300.	5.0
52140	Rapid antigen detection by kit method (e.g. Rapid Group A Strep, RSV, influenza A or B, Legionella, Trichomonas Antigen, Rotavirus, Adenovirus, Monospot, etc). Includes virus detection by simple dipstick for stools. Includes cassette based and membrane ELISA based kits and dipsticks.	2.1
52150	Anti-ENA (Extractable Nuclear Antigen) assay- by commercial kit method- manual (e.g. for nRNP/Sm, Sm, SS-A, SS-B, Scl-70 and Jo-1 antigens) Count once per specimen	3.0
52160	LIA- neuronal antigen profile line qualitative immunoassay- by commercial kit method (e.g. for neuronal antigens Amphiphysin, CV2, PNMA2, Ri, Yo, and Hu) Count once per specimen	7.0
52180	Conventional instrument based/plate/manual EIA – see the automated section in clinical chemistry	Refer to the clinical chemistry automated section
52200	Gas liquid chromatography – see the automated section in clinical chemistry	Refer to the clinical chemistry automated section
52240	Phase conversion for Salmonella (e.g. Gard plate, Craigie tube, Ditch plate)	3.0

Code	Laboratory Activity	Unit Value
52260	C. difficile antigen and/or toxin (e.g. test pack, membrane ELISA, etc)	3.8
52270	C. difficile cytoxin (e.g. cytoxicity test cell culture) Set up lat emulsion, inoculate, incubate read. Add 0.5 workload units for a second read on the second day if required.	4.6 0.5
52280	Antigen extraction e.g. enzyme, acid, heat e.g. for Lancefield grouping	0.7
52300	Latex slide agglutination for organism identification. Count once per antigen Does not include any waiting time while the test is incubating. Includes automated rocking. For manual rocking of a card, add code 52305.	0.7
52305	Latex agglutination - manual rocking time. If the test requires manual rocking of a card, add the rocking time as follows: 1) Determine the average number of tests per card/slide 2) Divide the required rocking time by the average number of tests on each card.	Standard time
52307	MRSA-screen sensitized latex agglutination (e.g. PBP2' detection) Includes: heat inactivation, centrifugation, antigen detection Includes automated rocking. For manual rocking of a card, add code 52305.	2.7
52310	Antigen-antibody tube agglutination for organism identification	1.0
52320	Rapid test for Mycoplasma/Ureaplasma – (e.g. Duo kit)	6.0
Susceptibility Testing		
	For automated susceptibility testing, please see code 52120.	
52480	Preparation of a dilution of organism to a specific McFarland Standard If a McFarland standard is included in the description of the activity, do not count code 52480. Applies to the inoculation of a broth to a density of a McFarland standard using a spectrophotometer or other	1.5

Code	Laboratory Activity	Unit Value
	measuring scale. May be claimed where standardization is required (i.e. preparation of a standardized colony suspension prior to inoculation etc.)	
52500	Kirby-Bauer method set-up Includes appropriate dilution to McFarland Standard, streaking and inoculation of antibiotic discs or graduated strip (e.g. e-test). Count once per initial plate set up.	4.1
52520	Additional Kirby-Bauer plates (with antibiotic discs or graduated strips) Count once per each additional plate.	1.5
52540	Replicator method Unit value = (1 x # orgs) + (# plates x 1)	As indicated
52560	Plate Susceptibility – read – discs (e.g. V factor, Novobiocin, Aminolevulonic acid) Count once per disc. When a disc is re-read a second time, count workload for code 52560 a second time.	0.2
52580	Plate susceptibility read – graduated strip (e.g. e-test) Count once per strip.	0.5
52600	Beta-lactamase Includes set up and read time.	0.5
52620	MIC (minimum inhibition concentration) by manual inoculation method e.g. broth dilution for multiple tubes (e.g. can be 10 tubes) Includes read time.	65.0
52640	MIC and MBC combined by manual method e.g. broth dilution	75.0
52660	Screenplate (e.g. Oxacillin screen plate, Vancomycin screen plate, etc.) Includes set up and read time.	2.0
52680	Sensititre (e.g. yeast susceptibility) - manual Includes set up and read time.	9.0
52700	ATB-ANA – anaerobic susceptibility	12.6

Code	Laboratory Activity	Unit Value
	Includes set up and read time.	
Mycology		
	For direct examination, please use the appropriate activity in the microscopy section (codes 50420-50900).	Refer to the clinical microbiology microscopy section
53010	Examine wet preparation directly from a fungal colony Example: examination of a scotch tape/cotton blue preparation, or the examination of a wet prep with KOH and/or calcofluor white.	3.6
53020	Inoculate, streak/embed, and tape for dermatophytes only For any other mycology specimen, please use the appropriate activity in the microbiological culture sections (codes 51000-51040). For the reading of all mycology cultures, including dermatophytes, please use the appropriate activity in the microbiological culture section (codes 51300-51380).	1.2
53040	Tease mount Includes the preparation, staining and reading.	5.0
53060	Slide culture Includes the preparation, staining and reading of the slide culture.	7.0
53080	Hair perforation test Includes reading.	15.0
53100	Germ tube Includes set up and reading. Includes “hands-on” time only.	2.0
53160	For biochemical or automated identification of fungus, please see the appropriate activities in the identification of microorganism section (codes 52000-52200). For example, sugar assimilation and fermentation, chlamydospore production.	Refer to the clinical microbiology microbiological identification section
53170	Cryptococcal antigen- automated rocker Includes: heat inactivation, centrifugation, and latex	2.7

Code	Laboratory Activity	Unit Value
	agglutination. Includes automated rocking. For manual rocking of a card, add code 52305.	
Parasitology Identification		
53490	Preparation of concentrate for parasitology	3.7
53500	Preparation of wet prep directly from a specimen or a concentrate and reading of wet prep for parasitology. For the preparation of smear for staining, please use the appropriate activity in the microbiological culture section (code 51000).	9.0
53520	Parasitology stain – see the anatomical pathology section for the workload units related to staining	Refer to the anatomical pathology section
53540	Read parasitology stained smear	12.0
53560	Examination of preparation for pinworm (paddle or scotch tape preparation)	4.0
53580	Parasite screening or identification by EIA – e.g. Cryptosporidium, Giardia.	2.1
53600	Identify worms or arthropods	10.0
53640	Identify Pneumocystis carinii – fluorescent antibody (e.g. calcofluor white) Includes only the time to read the slide (use the appropriate code from the anatomical pathology section for staining).	7.0
	Malaria – please see codes 33565, 33570, 33580 or 33600 in the clinical hematology section.	
Virology For specimen preparation activities, please use the appropriate activities listed in the Specimen Handling and Preparation section (codes 50010-50290).		
54000	Inoculation of tissue culture Count once for every cell line inoculated.	3.0
54020	Read tissue culture – each cell line Count once for every cell line read.	0.4
54040	Refeed cell line (change media) Capture this activity as service recipient activity only when it is	0.3

Code	Laboratory Activity	Unit Value
	used just prior to inoculating the cell line or for a cell line that is already inoculated. If this activity is performed for cell line maintenance, capture the activity as a non-service recipient activity.	
54060	Filtering and resetting (removal of bacterial contamination)	3.8
54080	Second Passage – tissue culture	3.5
54120	Hemadsorption/Hemagglutination	2.0
54140	Preparation of smear for virus identification by immunofluorescence Includes only the time to prepare the smear. For staining by direct or indirect immunofluoresence, please use the appropriate activity (codes 50560 or 50580), and for reading, please use code 50880.	3.0
54190	Rapid virus serology – detection of antibody by EIA kit – e.g. HIV, syphilis, CMV, etc.	2.1
54200	Rapid virus serology – detection of antibody – EIA automated – see clinical chemistry section in the schedule of unit values	Refer to the clinical chemistry automated section
54220	Direct virus antigen detection Example: Manual ELISA for rotavirus, Rotaclone.	4.0
54240	Antibody detection by strip immunoblot – manual or kit	6.0
	For rapid detection of antigen (e.g. RSV, influenza, Rotavirus, Adenovirus, Monospot, etc), please use code 52140.	
Serology		
54400	EIA – automated detection including automated chemiluminescence, see the automated section in clinical chemistry	Refer to the clinical chemistry automated section
	Latex agglutination Please see code 52300.	Refer to code 52300
	Tube agglutination Please see code 52310.	Refer to code 52310

Code	Laboratory Activity	Unit Value
54460	Anti Streptolysin - O screen	2.0
54470	Anti Streptolysin - O titration	30.0
Molecular Microbiology		
55000	Nucleic acid testing by kit method – e.g. Chlamydia & GASD	1.3
55020	Manual extraction (e.g. phenol/chloroform)	11.0
55040	Kit based extraction only (e.g. QIAamp by Qiagen)	10.0
55060	Automated extraction (e.g. EZI BioRobot)	3.2
55080	Kit based simultaneous extraction, amplification and detection (e.g. Geneohm kits)	3.0
55125	Master mix calculation and preparation of plate map Includes calculation of volume of each master mix component and preparation of plate map. Count once per run.	5.0
55126	Master mix preparation Includes pipetting each component into the master mix. Count once per run.	7.0
55128	Loading of master mix/specimens and controls and components into plates: Count once per well (do not count codes 55130 and 55128 simultaneously).	0.4
55130	Loading of master mix /specimens and controls and components into Smartcyler tubes Count once per tube (do not count codes 55130 and 55128 simultaneously).	1.0
55132	Programming instrument Count once per run.	8.0
55134	Data analysis and reporting into HIS/LIS Count once per reportable result. • Single analyte • Double analytes • Multiple analytes	 1.6 3.0 5.0

Code	Laboratory Activity	Unit Value
55136	Validation of molecular analysis by a senior technologist Count once per reportable result and only if performed by unit-producing personnel.	1.5
55160	Detection – luminex automated probe/bead (flow cytometry assay) Includes the preparation of the standard curve where required.	7.0
55200	Nucleic acid hybridization (e.g. DNA hybridization for HPV using Southern Blot)	9.0
55230	DNA sequencing/ interpretation	9.0
55260	Pulse field gel electrophoresis (PFGE) Includes the preparation of the plug, digestion, electrophoresis and staining/interpretation.	38.0
55280	Epidemiological analysis of organism from PFGE Count once per organism.	16.0
Miscellaneous		
56000	Renal water set up and read culture Includes a colony count	1.2
56010	Dialysate set up and read culture Includes a colony count	1.2
56020	Drinking water – set up and read culture Includes a colony count	1.2
	Food preparation for culture For preparation activities, please use the appropriate specimen preparation codes 50010-50080.	Refer to the clinical microbiology specimen preparation section
56060	Food set up and read culture Includes a colony count	40.0
56100	Endotoxin testing – limulus amebocyte lysate (LAL), pyrogen testing	2.5
56120	Validation of results Note: this activity refers to the review of the results, prior to	0.4

Code	Laboratory Activity	Unit Value
	issuing a report, by a second staff member, to ensure that the appropriate testing has been performed for the identification of the organism, that the organism reported is appropriate, and to identify if the organism is reportable to other agencies (e.g. public health).	
56140	Manual transfer of reportable results Includes the manual entry of preliminary/final results into an electronic system. Does not include documentation of internal analytical or descriptive results (e.g. catalase result or colony description). Count once for each preliminary, final or corrected report. Example: If 2 preliminary reports and one final report are manually transferred to the LIS, count the workload x 3: once for each instance of manual result transfer) Do not collect if the transfer of results is automated. Note: interim test results (e.g. the result of a catalase or other test of an organism) are not included in this code as the documentation (paper or electronic) is included in the unit value for the activity itself.	0.5

Immunology

This section includes a list of activities commonly performed in an immunology laboratory that pertain to the investigation of auto-immune disorders, and to the performance of investigative procedures on service recipients with conditions related to the body's defense mechanism against the invasion of foreign substances.

Activities are grouped and presented under six headings that include:

- Flow Cytometry
  - Specimen Preparation
- Staining
- Data Acquisition/Analysis
- Reporting
- Miscellaneous
- Immunofluorescence
  - Slide Preparation
  - Slide Staining
  - Slide Review
- Other

Any activity in this list can be utilized by any clinical laboratory functional centre if the unit value is accurate and reflective of the realistic average time required to perform a specified activity.

Code	Laboratory Activity	Unit Value
Flow Cytometry		
Specimen Preparation		
93010	Preparation of kits—complex Applies to any in-house prepared complex specimen collection kits that are intended for use by individuals outside the department. Complex refers to kits that require manual manipulation of raw material prior to including it in the kit (e.g. 24 hour urine which includes measuring and adding preservative, adding special warning labels and waiver documentation or cytology kit—measuring preservative, adding warning labels and instructions).	1.7
93015	Tissue disaggregation (e.g. lymph nodes, spleen) Includes washes.	10.0
93017	Tissue disaggregation- semi-automated	6.0
93030	Cell count—automated	See appropriate activities in hematology
93035	Cell count—hemocytometer	3.0
93036	Cell count adjustment Includes making all appropriate dilutions or concentrations.	0.5
93040	Determination of the appropriate cell population (e.g. preliminary scattergram) to ensure integrity of the sample and excluding preparation (example: Q-prep) Count only if the determination must be made using the flow cytometer prior to staining	1.2
Staining		
Definition: A pipetting activity includes one pipetting sequence and includes loading the pipette tip(s), aspirating a liquid, dispensing the liquid, rinsing the pipette tip(s) (if applicable) and disposing of the pipette tip(s). A pipetting sequence includes all the pipetting tips used on a multi-channel pipettor.		

Code	Laboratory Activity	Unit Value
93050	Aliquotting of specimen and antibodies (for use only when aliquotting for flow cytometry) Includes labelling tubes. Count once for each two pipetting activities (e.g. adding the specimen and first antibody) (see definition). Collect an additional 0.2 workload units if adding a third reagent or antibody to the reaction tube.	0.5 + 0.2 for the addition of a third reagent or antibody
93055	Aliquotting of specimen and antibodies using liquid handling system Includes labelling tubes, set up, loading and unloading of specimens. Count once per tube set up. Note that for the loading and unloading of reagents/antibodies, use code 02242.	0.3
93060	Lysing - Manual Includes adding lysing agent manually, incubating and washing. Count once per tube.	1.0
93065	Lysing - Semi-Automated (e.g. Q prep): Includes loading (introduction of tubes singly), programming, running and unloading instrument Count once per tube.	0.3
93070	Lysing - Automated (e.g. Multi-Q prep): Includes loading (introduction of multiple tubes), programming, running and unloading instrument. Count once per tube.	0.2
93075	Manual washing Use this activity in addition to any other activity when manual washes are required and not already described in the activity. • 2 tubes at a time • 4 tubes at a time • 8 tubes at a time • 12 tubes at a time Count only once per wash (do not count per tube).	 1.7 2.5 3.7 5.0

Code	Laboratory Activity	Unit Value
Data acquisition/analysis		
93100	Data entry into flow cytometry software/worklist generation Barcoded samples/requisitions interfaced with HIS/LIS Count once per tube	1.3
93110	Data entry into flow cytometry software/worklist generation Manual data entry per tube. Count once per tube	0.4
93120	Data acquisition • Manual acquisition (gate setting) Count once per marker. If a marker is used for gating multiple tubes, then count the gating marker only once for the entire panel Example: where 5 different colour markers are used and one marker is CD45 used to gate: workload is counted as 5 x 0.5 for the first tube = 2.5 units. When a second tube is acquired from the same service recipient with 4 new markers and CD 45 used to gate, then count 4 x 0.5 = 2.0. (E.g. CD 45 is used for gating in multiple tubes and is counted only once).	0.5
93130	Data acquisition • Automated data acquisition Count once per marker. If a marker is used for gating multiple tubes, then count the gating marker only once for the entire panel See example from 93120.	TBD
93140	Data acquisition • CD4/CD8 data acquisition (including CD3) Count once per marker.	0.25
93200	CD 34 enumeration (software assisted acquisition)	0.5

Code	Laboratory Activity	Unit Value
Reporting		
93300	Analysis and report collation Includes review of gates, histograms, and the collection and review of previous results, histograms, slides. Count once per service recipient. Note that for exceptional troubleshooting, please use code 12070	4.0
93305	Results review Includes the review of the gates and data, and collation and summary of results prior to submission for a medical opinion, and identification of data for future reference. • CD 4/CD 8 Count once per service recipient.	0.5
93306	Results review Includes the review of the gates and data, and collation and summary of results prior to submission for a medical opinion, and identification of data for future reference. • Immunophenotyping Count once per service recipient.	15.0
93310	Numerical report CD 4/CD 8 Single platform Includes the preparation of report with numerical values. Also includes calculations, reporting of the numerical values in the appropriate information system if applicable. Count once per marker reported.	0.3
93311	Numerical report • CD 4/CD 8 Dual platform Includes the preparation of report with numerical values. Also includes calculations, reporting of the numerical values in the appropriate information system if applicable.	0.5

Code	Laboratory Activity	Unit Value
	Count once per marker reported.	
93312	Numerical report • Other immunophenotyping Includes the preparation of report with numerical values. Also includes calculations, reporting of the numerical values in the appropriate information system if applicable. Count once per marker reported.	0.3
93320	Archiving of data Includes the appropriate filing and archiving of histograms, data and report for future reference. Count once service recipient.	3.0
93325	Electronic sign out Includes the time required to complete, verify, transmit and print the electronic data.	1.5
Miscellaneous		
93430	Reticulated Platelets	Actual or Standard Time
Special Instructions: For oxidative burst analysis, use the appropriate activities for pipetting (93050 or 93055), data acquisition and data analysis. For the latter, the tagged reagent is considered the marker.		

Code	Laboratory Activity	Unit Value
Immunofluorescence (ANA, ANF)		
Slide Preparation		
93498	Specimen preparation Includes generating worklists, finding and putting specimens in order and investigating previous results. Count once per service recipient. If centrifugation is required to remove fibrin clots from frozen specimens, add 0.2 workload units per specimen.	0.5
93499	Manual slide selection and numbering Count once per slide.	0.1
Slide Staining		
93500	Pre-staining dilution – Manual single dilution Count once per dilution	0.5
93505	Pre-staining dilution – Manual serial dilutions Count once for the first 4 tubes. Add 0.5 workload units for each subsequent tube.	1.5

Code	Laboratory Activity	Unit Value
93510	Pre-staining dilution - Semi automated (using automated diluter) Count once per specimen.	0.6
93520	Staining—manual Includes applying the specimen and conjugate as well as the required washes. Count once per well.	0.8
93530	Staining – automated (e.g. PHD system) Includes programming the instrument, loading the slides, reviewing results and unloading the slides. Count once per specimen.	1.3
93531	Manual transfer of demographic data to a worklist for automated system Use ONLY if your process requires the manual transfer of data to an automated system (e.g. not interfaced). Count once per specimen	0.3
93532	Manual transfer of result data to a paper worklist Use ONLY if your process requires the manual transfer of results from an automated system worklist to a different paper worklist for entry into an HIS/LIS. Count once per specimen.	0.3
93533	Manual reporting of ANA result in HIS/LIS – numerical or canned messages Use only for the manual transfer of results from an instrument or a worklist to an HIS/LIS without an interface. Count once per-specimen.	0.3
93540	Coverslipping Includes adding the media to each individual well and coverslipping. Count once per slide (may include multiple wells).	0.5

Code	Laboratory Activity	Unit Value
Slide review Note: if a well is read by two different UPP, count this activity twice)		
93550	Manual review of slide Includes interpretation of the patterns. ▪ ANA and titres (including software assisted titre) Count once per well. Note: the workload unit is an average of positive and negative results. If the positivity rate in a particular laboratory is >75%, it is recommended that a time study be performed to determine a more representative unit value.	0.7
93555	Manual review of slide Includes interpretation of the patterns. • ANCA and other complex IFA Count once per well. Note: the workload unit is an average of positive and negative results. If the positivity rate in a particular laboratory is >75%, it is recommended that a time study be performed to determine a more representative unit value.	1.5
Other		
93600	Radial Immunodiffusion (e.g. IgD, C1 esterase) Count once per well.	5.0
93610	Nephelometry	Refer to the clinical chemistry section

Code	Laboratory Activity	Unit Value
93630	Immunology semi quantitative testing for anti MPO, GBM and PR3 antigens using commercial kit (E.g. e.g. Zeus Scientific AtheNA System Vasculitis Plus®) Automated assay read and analysis. Count once per specimen.	1.3
93640	AENA profile- semi-quantitative manual ELISA immunoassay using commercial kit (e.g. EUROIMMUN Anti-ENA ProfilePlus 1®) Includes loading, washings, pipetting, transfer to plate reader, and transfer of readings. Count once per sample.	2.8
93650	ANA via multiplexed, fluorescent, bead-based system (e.g. AtheNA Multi-Lyte® system) Includes creation of patient worklist and plate map, mixing and pipetting bead suspension, loading the filtration place, rinsing beads and blotting plate and adding/mixing conjugate. Count once per specimen – regardless of the number of tests performed in a single well. Count the following separately: • Preparing specimen dilutions (code 93500) • Program analyser (code 21000) • Consolidate results (code 93532) • Entering of results (code 23150)	1.5 per specimen

Histocompatibility and Immunogenetics

This section includes a list of activities commonly performed in the Histocompatibility and Immunogenetics laboratory that pertain to the typing of human lymphocyte antigens (HLA) and to the performance of tissue cross-matching between donor and recipient. Activities are grouped and presented under eleven headings that include:

- Specimen Preparation
- HLA Typing – Serological
- HLA Typing – Molecular
- HLA Antibody Screen/Identification – Solid Phase (ELISA)

- HLA Antibody Screen – Flow Cytometry
- HLA Antibody Identification – Flow Cytometry
- HLA Antibody Screen/Identification – by Luminex®)
- HLA Antibody Screening/Identification – Complement Dependent Cytotoxicity (CDC)
- HLA Crossmatch – Flow Cytometry
- HLA Crossmatch – Complement Dependent Cytotoxicity (CDC)
- Miscellaneous

Any activity in this list can be utilized by any clinical laboratory functional centre if the unit value is accurate and reflective of the realistic average time required to perform a specified activity.

Recording Instructions

1. Unit values for aggregated activities:
   Unit values for aggregated activities may be used for some activities in the histocompatibility and immunogenetics section. For example, if every antibody screen by flow cytometry includes antibody staining with manual washes of 12 tubes (code 91000), data acquisition of 12 tubes (code 91090), data analysis (code 91120) and report verification (code 91160), the organization may choose to assign a combined workload unit to each blood specimen received as follows:

91000 – Antibody staining – manual washes (12 tubes x 4)	48.0
91090 – Data acquisition (12 tubes x 1.7)	20.4
91120 – Data analysis - screening	5.4
91160 – Report verification	1.7
Combined workload units for each antibody screen:	**75.5**

   In this case, the organization can assign 75.5 workload units for each antibody screen by flow cytometry.

2. Relative unit values for occasional activities
   Relative unit values for occasional activities may be used for some activities in the histocompatibility and immunogenetics section. For example, an organization may choose to develop an aggregate value for the supervisory review of cases that includes a number of different types of reviews. An audit of the supervisory review of cases is performed and demonstrates the frequency of each type of review is as follows:

   - Diseases associated review – (50%)
   - Bone marrow transplant – related (5%)
   - Bone marrow transplant – unrelated (10%)
   - Solid organ transplant – simple cadaveric donor (20%)

- Solid organ transplant – simple live donor (5%)
- Solid organ transplant – complex (5%)
- Transfusion medicine support (5%)

The organization can then develop an aggregate workload unit for supervisory review of all types of cases as follows:

• Diseases associated review (50% x 10.0)	5.0
• Bone marrow transplant – related (5% x 15.0)	0.75
• Bone marrow transplant – unrelated (10% x 35.0)	3.5
• Solid organ transplant – simple cadaveric donor (20% x 80.0)	16.0
• Solid organ transplant – simple live donor (5% x 30.0)	1.5
• Solid organ transplant – complex (5% x 50.0)	2.5
• Transfusion medicine support (5% x 20.0)	1.0
Aggregate workload unit for supervisory review of all types of cases:	**30.25**

When using relative values for occasional activities, it is important to re-evaluate the percentages used on a regular basis or when the service changes significantly.

3. Deconstructed workload units:
   A deconstructed workload can be used for some activities in the histocompatibility and immunogenetics section. For example, the manual ELISA for HLA antibody detection with manual washes (activity 90830) is assigned 78.0 workload units per 96 well tray. If the organization wishes to collect the workload unit for each well instead of for each tray, they will conduct an audit (retrospective or prospective) to determine the average number of wells that are analyzed per tray, and then assign the appropriate workload unit to each well. Assume that an audit determines that, on average, 92 wells are analyzed on each tray. The deconstructed workload is then calculated as follows:

   $$\frac{\text{Workload unit per tray}}{\text{Number of wells per tray}} = \text{workload unit per well}$$

   $$\frac{78.0}{92} = 0.85 \text{ workload units per well}$$

   When using deconstructed values, it is important to re-evaluate the proportions used on a regular basis or when the service changes significantly.

4. Modification for titration crossmatch
   For titration of a crossmatch, count all the appropriate activities and multiply the appropriate activities by the number of tubes.

For example, if a titration crossmatch by flow cytometry with manual washes and manual tube acquisition requires 28 tubes, the workload for the titration would be:

91500 – Crossmatch flow cytometry - manual washes:	28 x 4.2	117.6
91560 – Data acquisition – manual tube acquisition:	28 x 2.5	70.0
91650 – Data analysis for crossmatch:	28 x 2.1	58.8
91660 – Report verification		15.0
Total workload units for titration for each crossmatch		**261.4**

Code	Laboratory Activity	Unit Value
Specimen Preparation		
90007	Review of specimen at time of receipt- simple (e.g. typing specimens, routine serum sample) Includes matching of the specimen type, verification of the appropriateness of testing order, review of service recipient history and service recipient grouping, if applicable. Note: if a specimen is not accessioned in a specialized receiving area and only accessioned in histocompatibility and immunogenetics, also count 10500 for the accessioning activity in the pre/post analysis section of the schedule of unit values.	5.0
90008	Review of specimen at time of receipt- complex (e.g. call back to service recipient, obtain donor and recipient histories, determine antibodies profile if unknown, post-transplant service recipients) Includes matching of the specimen type, verification of the appropriateness of testing order, review of service recipient history and service recipient grouping, if applicable. Note: if a specimen is not accessioned in a specialized receiving area and only accessioned in histocompatibility and immunogenetics, also count 10500 for the accessioning activity in the pre/post analysis section of the schedule of unit values.	15.0
90020	Lymphocyte isolation using beads (e.g. Fluorobeads®, Dynabeads®) Includes all washes and aliquotting of reagents. Excludes preparation of reagents (e.g. McCoys).	9.0
90070	Removal of granulocytes/monocytes/platelets Includes multiple quick spins and one-step antibody-based cocktail for cell isolation (e.g. RosetteSep® or Lymphoquick)	8.0
90100	Lymphocyte count adjustment	2.5

Code	Laboratory Activity	Unit Value
	Includes performing lymphocyte count (or estimate) and adjusting the concentration.	
90130	Ultracentrifugation of serum Includes flash freezing.	5.0
90160	Density gradient isolation of monocytes – per 10 mls of diluted blood (e.g. Ficoll Hypaque or Percoll ®) Includes layering of cells and washing.	13.0
90200	Tissue disaggregation (e.g. lymph nodes, spleen)	10.0
HLA Typing – Serological		
90300	Serological methods Includes preparation, labelling and loading of tray, complement, dyes, quenching, scoring and analysis, recording and documentation of results. Count once per tray.	30.0
HLA Typing – Molecular		
90350	Manual extraction Includes phenol/chloroform or salt extraction.	11.0
90360	Manual extraction using a kit (e.g. Qiagen columns) Excludes optical density.	10.0
90400	Automated DNA extraction (e.g. Qiagen, M48, ABI) using robotics	7.0
90410	Master mix preparation	5.0
90430	Amplification – Sequence Specific Primers (SSP) Includes loading with master mix and DNA preparation, program selection of the thermocycler. Count once for up to 8 wells/tubes.	1.2
90460	Amplification – Sequence Specific Oligonucleotide (SSO) Includes preparation of worksheets with associated calculations, preparation of wells, loading with master mix and DNA preparation and program selection of the thermocycler including input of service recipient information. Count once for up to 8 wells/tubes.	1.2

Code	Laboratory Activity	Unit Value
90490	Amplification – Sequence Based Typing (SBT) Includes primary amplification, removing extra primers, secondary amplification, precipitation/wash or column, loading buffer and running the sequencing.	20.0
90520	Detection – gel electrophoresis Includes pre-soak and loading of gel, running the electrophoresis and staining of gel. Count once per gel. For making of gels see code 02242a in the non-service recipient activity section of the schedule of unit values.	4.0
90550	Detection – Luminex® Includes denaturation of DNA, loading of beads, hybridization of beads, wash steps, streptavidin PE, wash steps, transfer into the reading tray, batch set up (mapping tray) in the instrument and loading tray in instrument. Count once per sample per locus.	6.0
90580	Detection – strip (e.g. Dynal method) Includes, loading tray with DNA, strip, substrate/conjugate, hybridization and scanning of strips. Count once per strip of 8 wells.	5.0
90610	Analysis – manual only Includes reviewing the results of the detection methodology to identify the appropriate alleles. Also includes manually aligning the sequences. • SSP high res (count once per allele)	8.0
90615	Analysis – manual only Includes reviewing the results of the detection methodology to identify the appropriate alleles. Also includes manually aligning the sequences. • SSP low res (count once per loci).	8.7
90620	Analysis – manual only Includes reviewing the results of the detection methodology to identify the appropriate alleles. Also includes manually aligning the sequences.	8.0

Code	Laboratory Activity	Unit Value
	• SSO strip (count once per allele per strip).	
90630	Analysis – manual only Includes reviewing the results of the detection methodology to identify the appropriate alleles. Also includes manually aligning the sequences. • SBT (count once per allele).	10.0
90640	Analysis – software assisted only. Includes manual interpretation where applicable • SSP high res (count once per allele).	5.0
90645	Analysis – software assisted only. Includes manual interpretation where applicable • SSP low res (count once per loci)	5.0
90650	Analysis – software assisted only. Includes manual interpretation where applicable • SSO strip (count once per allele per strip)	3.0
90655	Analysis – software assisted only. Includes manual interpretation where applicable • SSO Luminex® (count once per loci) Includes only simple acquisition and checking of results. Do not count 90690 with 90655.	0.5
90660	Analysis – software assisted only. Includes manual interpretation where applicable. • SBT	9.0
90670	Photography – includes uploading of digital photographs Count once per photo/gel.	6.0
90690	Results/Test verification Includes verification by a second unit-producing personnel. Includes compilation of multiple test results, data entry and test verification per test result incorporated into a case. Do not count 90690 with 90655. Count once per service recipient.	15.0

Code	Laboratory Activity	Unit Value
HLA Antibody Screen/Identification – Solid Phase (ELISA)		
90800	Serum dilution Includes labelling of the tube and all dilutions related to the sample in preparation for HLA. Count once per sample.	1.0
90830	Manual ELISA with manual washes Includes preparation, soaking and loading of tray with specimen, adding conjugated antibody, substrate and all the washing steps. Count once per 96 well tray.	78.0
90860	Manual ELISA with automated washes Includes preparation, soaking and loading of tray with specimen, adding conjugated antibody, substrate and all the washing steps. Count once per 96 well tray.	55.0
90890	Read optical density Count once per tray of up to 96 wells.	2.0
90910	Analysis – manual • Screening (positive/negative) Count once per sample analyzed.	2.0
90920	Analysis – manual • Antibody identification Count once per sample analyzed.	16.0
90940	Analysis – software assisted • Screening (positive/negative) Count once per sample analyzed.	10.0
90950	Analysis – software assisted • Antibody identification Count once per sample analyzed.	10.0
HLA Antibody Screen – Flow Cytometry		
91000	Antibody staining – manual washes Includes adding the beads, serum, anti-IgG, fixing and manual wash steps. If multiple bead cocktails are required to be prepared for a single tube, count 4.7 workload units instead.	4.0 4.7

Code	Laboratory Activity	Unit Value
	Count once per tube.	
91050	Serum adsorption for background reactivity	5.0
91080	Data acquisition – manual load tube acquisition Includes loading and unloading of tubes. Count once per tube.	0.05
91090	Data acquisition – auto load tube acquisition Includes loading and unloading of tubes. Count once per tube.	1.7
91120	Data analysis – screening Includes positive/negative calculations and architecture analysis.	5.4
91160	Report verification Includes the initial write up of the report and the verification by second unit-producing personnel.	1.7
HLA Antibody Identification – Flow Cytometry		
91200	Antibody staining – manual washes- with fixing Includes adding the beads, serum, anti-IgG, fixing and manual wash steps. May include using commercial kit (e.g. Euroimmun kit®) Count once per tube. Count once per tray well.	5.2 3.0
91205	Antibody staining for antibody profiles (E.g. antiparaneoplastic antibody IFA and LIA assay) – manual washes- without fixing. Includes adding the beads, serum, anti-IgG, and manual wash steps. May include using commercial kit (e.g. Euroimmun kit®) Count once per specimen.	7.0
91240	Data acquisition – auto load tube acquisition Includes loading and unloading of tubes. Count once per tube.	2.2
91260	Data analysis – identification	3.7

Code	Laboratory Activity	Unit Value
	Includes scoring of fluorescence and evaluation of controls and self HLA reactions. Count once per serum.	
91280	Report verification Includes the initial write up of the report and the verification by a second unit-producing personnel.	2.8
HLA Antibody Screening/Identification – by Luminex®		
91300	Preparation of tray Includes mapping of tray, setting up data interfaces, pre wetting, addition of buffers, test serum, beads, conjugate and washing between steps. Count once per well prepared.	2.1
91320	Data acquisition Includes loading the reader and acquiring the data. Count once per well read.	1.0
91330	Analysis – screening (positive/negative) Includes analysis of the sample data and adjusting thresholds as required. Count once per sample analyzed.	3.0
91340	Analysis – identification Includes analysis of the sample data and adjusting thresholds as required. Also includes disposition of results which may or may not include creating a pdf report or JPEG file for electronic documentation or printing out hard-copies and transfer of results to an appropriate reporting system. Count once per sample analyzed.	3.0
HLA Antibody Screening/Identification – Complement Dependent Cytotoxicity (CDC)		
91400	CDC with AHG Includes preparation, labelling and loading of commercially available frozen cell trays with serums, washes, AHG, complement, dyes, quenching, micro evaluation, analysis, scoring and reporting. Count once per tray.	23.0

Code	Laboratory Activity	Unit Value
91410	CDC with AHG Includes labelling and loading of tray with multiple service recipient sera, a panel cell, washes, AHG, complement, dyes, quenching, micro evaluation, analysis, scoring and reporting. Count once per tray.	24.5
91420	CDC without AHG Includes preparation, labelling and loading of tray with serums, complement, dyes, quenching, micro evaluation, analysis, scoring and reporting. Count once per tray.	18.0
HLA Crossmatch – Flow Cytometry		
91500	Crossmatch – flow cytometry – manual washes Includes addition of serum, cells, anti-IgG and appropriate CD markers and manual wash steps. Count once per tube.	4.2
91530	Crossmatch – flow cytometry – automated washes Includes addition of serum, cells, anti-IgG and appropriate CD markers and automated wash steps.	3.3
91540	Pronase treatment Count once per crossmatch.	2.0
91560	Data acquisition – manual tube acquisition Count once per tube.	2.5
91590	Data acquisition – auto load tube acquisition Includes loading and unloading of tubes. Count once per tube.	1.8
91650	Data analysis for crossmatch Includes scoring of fluorescence and evaluation of controls (positives/negatives). Count once per tube.	2.1
91655	Data analysis for crossmatch using MESF bead conversion Count once per crossmatch tube.	0.5
91660	Report verification	15.0

Code	Laboratory Activity	Unit Value
	Includes the initial write up of the report and the verification by a second unit-producing personnel. Verification may include verification of transcription as well as verifying if duplicates agree. Count once per crossmatch.	
HLA Crossmatch – Complement Dependent Cytotoxicity (CDC)		
91690	Preparation of crossmatch trays Includes preparation, labelling and loading of trays with serum. Count once per tray.	12.0
91700	Crossmatch – CDC with AHG Includes loading of tray with cells, washes, AHG, complement, dyes, quenching, micro evaluation, analysis, scoring, data entry and preliminary report (if applicable). Count once per crossmatch. • Single donor – single recipient (live donor) count once per tray used	23.0
91710	Crossmatch – CDC with AHG Includes loading of tray with cells, washes, AHG, complement, dyes, quenching, micro evaluation, analysis, scoring, data entry and preliminary report (if applicable). Count once per crossmatch. Single donor – multiple recipients (deceased donor) count once per tray used	23.0
91720	Crossmatch – CDC without AHG Includes loading of tray with cells, washes, complement, dyes, quenching, micro evaluation, analysis, scoring, data entry and preliminary report (if applicable). Count once per crossmatch. • Single donor – single recipient (live donor) count once per tray used	18.0
91730	Crossmatch – CDC without AHG Includes loading of tray with cells, washes, complement, dyes, quenching, micro evaluation, analysis, scoring, data entry and preliminary report (if applicable). Count once per crossmatch.	18.0

Code	Laboratory Activity	Unit Value
	Single donor – multiple recipients (deceased donor) count once per tray used	
Miscellaneous		
91800	Supervisory review Includes consolidating HLA results with other clinical results and data by the senior/supervisory staff. • Disease associated review (e.g. autoimmune disease) • Bone Marrow transplant – related • Bone Marrow transplant – unrelated • Solid organ transplant – simple cadaveric donor • Solid organ transplant – simple live donor • Solid organ transplant – complex (e.g. sensitized recipient) • Transfusion medicine support (interpret platelet antibody) Capture this activity only if performed by unit-producing personnel. Do not count if this activity is performed by management and operational support personnel or medical staff (e.g. pathologist, resident). Count once per case.	10.0 15.0 35.0 80.0 30.0 50.0 20.0
91820 91830	Freezing lymphocytes • First vial • Each subsequent vial	8.0 1.0
91840	Thawing lymphocytes	7.0
91860	Killer like immunoglobulin receptor – see HLA typing activities (SSO, SSP, SBT)	Refer to the HLA typing section
91920	Data interpretation Includes final report review, correlating the results of the HLA typing with the clinical record, and sign off by technical director	

Code	Laboratory Activity	Unit Value
	• Disease associated review (e.g. autoimmune disease) • Bone Marrow transplant – related • Bone Marrow transplant – unrelated • Solid organ transplant – simple cadaveric donor • Solid organ transplant – simple live donor • Solid organ transplant – complex (e.g. sensitized recipient) • Transfusion medicine support (interpret platelet antibody) Capture this activity only if performed by unit-producing personnel. Do not count if this activity is performed by management and operational support personnel or medical staff (e.g. pathologist, resident). Count once per final report.	5.0 10.0 10.0 10.0 10.0 10.0 3.0
91950	Case review/consult Includes the research required by the technical director and performed by unit-producing personnel including any consultation required by the director with clinical staff. This is usually undertaken in cases requiring special information/advice. Capture this activity only if performed by unit-producing personnel. Do not count if this activity is performed by management and operational support personnel or medical staff (e.g. pathologist, resident).	Actual or Standard Time
91960	Technical review for preliminary reporting on deceased donors Includes creation of donor/recipient lists. Capture this activity only if performed by unit-producing personnel. Do not count if this activity is performed by management and operational support personnel or medical staff (e.g. pathologist, resident).	30

Diagnostic Genetics

This section includes a list of activities commonly performed in a diagnostic genetics laboratory that pertain to the analysis of blood, body fluids, tissues or other material for the purpose of identifying specific genetic constituents using DNA probes or other molecular markers and the investigation of cellular constituents related to heredity of service recipients with known or suspected chromosomal abnormalities. Activities are grouped and presented under fourteen headings that include:

- Cytogenetic Specimen Preparation
- Cytogenetic Culture
- Cytogenetic Examination
- Fluorescent In Situ Hybridization (FISH)
- Microarray
- DNA Purification
- Cytogenetic - Freezing Tissue
- DNA Extraction
- Molecular Genetics Specimen Preparation
- Extraction of Nucleic Acid
- PCR Reactions
- Nucleic Acid Detection
- Analysis of PCR Assays
- Southern Blot
- Miscellaneous

Any activity in this list can be utilized by any clinical laboratory functional centre if the unit value is accurate and reflective of the realistic average time required to perform a specified activity.

Recording Instructions

1. Unit values for aggregated activities:
   Unit values for aggregated activities may be used for some activities in the diagnostic genetics section. For example, if a normal karyotype always includes the activities below, the organization may choose to aggregate the unit value as follows:

82000 – Prepare slide	4.0
82040 – Routine staining	2.0
82160 – Manual scanning to select metaphases	10.0
82270 – Complete analysis – normal metaphase	8.0
82360 – Image capture (semi-automated)	5.0
82400 – Karyogram	20.0
82440 – Collation and write-up	10.0
82460 – Technical checking/reporting – normal	20.0
Combined workload unit for each normal karyotype:	**79.0**

2. Relative unit values for occasional activities

A. Relative unit values for occasional activities may be used for some activities in the diagnostic genetics section. For example, an organization may choose to develop an aggregate value for the technical checking/reporting of cytogenetic analysis (codes 82460, 82480 and 82520), that includes normal, abnormal and complex abnormal reports. An audit is performed to determine the frequency in which the different types of reports occur in a representative period of time.

If the audit determines that 50% of all cytogenetic reports that are technically checked/reported are normal, 35% are abnormal, 10% are complex abnormal with one extra cell line, and 5% are complex abnormal with two extra cells lines, then the organization may assign an aggregate workload unit for each report as follows:

82460 – Technical checking/reporting – normal	(60% x 20.0)	12.0
82480 – Technical checking/reporting – abnormal	(25% x 26.0)	6.5
82520 – Technical checking/reporting – complex abnormal – 1 cell line	(10% x 15)	1.5
82520 – Technical checking/reporting – complex abnormal – 2 cell lines	(5% x 15)	0.75
Aggregate workload unit for technical checking/reporting for all types of cytogenetic reports		**20.75**

When using aggregate values, it is important to re-evaluate the percentages used on a regular basis or when the service changes significantly.

B. The same approach can be used when there is a different unit value for normal or abnormal samples. A proportional unit value can be assigned to each sample. The proportional value is reflective of the individual laboratory's service recipient population.

The proportional value is determined as follows. Perform an audit of the samples analyzed, and determine the proportion of normal/abnormal samples. Multiply the percentage of the normal samples by the unit value for normal samples, and multiply the percentage of abnormal samples by the unit value for abnormal samples. Add the two unit values together and use this value as the unit value for each sample.

For example, if the unit value for 87510 normal samples is 0.5 and the unit value for abnormal samples is 5.0. If during the last year, the laboratory had 60% normal samples and 40% abnormal, the proportional unit value can be calculated as: (60% x 0.5) + (40% x 5.0) = (0.3) + (2.0) = 2.3 units for each sample.

The audit should be reviewed on a regular basis or whenever there is s significant change in service recipient population.

3. Cytogenetics setup
   Count setup for cytogenetics for each specimen/tissue type (codes 81000-81080). Do not count extra workload for replicate cultures of the same tissue type.

   For those specimens that require multiple independent cultures from different processing stages to achieve targeted population growth, for example, solid tumour culture from transport medium, from tissue explant and from enzyme treated minces, count the appropriate workload for each stage as a separate tissue type.

4. Cytogenetic analysis
   For each metaphase analyzed, capture only codes 82240, 82270, 82280 or 82320. Do not capture more than one of these codes for any single metaphase.

5. Composite karyogram
   For a composite karyotype, count code 82360 for each image captured and code 82400 only once for the karogram analysis.

6. Accessioning and aliquotting
   For accessioning a sample, see activity 10500 in the Pre-Post analysis schedule. For aliquotting a specimen, see activity 85740 in the schedule below.

Code	Laboratory Activity	Unit Value
Cytogenetic Specimen Preparation		
80010	Tissue preparation – complex (e.g. CVS) Includes cutting and/or cleaning tissue. Count once per tissue prepared.	30.0
80020	Tissue preparation – intermediary (e.g. tumours, lymph nodes, POC) Includes cutting and/or cleaning tissue. Count once per tissue prepared.	20.0
80030	Tissue preparation – simple (e.g. skin biopsies) Includes cutting and/or cleaning tissue. Count once per tissue prepared.	10.0
80050	Tissue disaggregation Includes the time to add reagents, mix, incubate and all the	10.0

Code	Laboratory Activity	Unit Value
	required washings. Count once per enzyme used.	
Cytogenetic Culture		
81000	Set up blood, bone marrow, pleural fluid, other fluid Includes the hands-on time to load/unload the centrifuge/incubator, label of FDT (flask, disk or tube) and plating of cells. Excludes the time the specimen is centrifuging and incubating without manual manipulation. Count once per tissue type.	8.0
81040	Set up amniotic fluid Includes the hands-on time to load/unload centrifuge/incubator, label of FDT and plating of cells. Excludes the time the specimen is centrifuging and incubating without manual manipulation. Count once per specimen.	20.0
81080	Set up tissue Includes the hands-on time to load/unload centrifuge/incubator, label of FDT and plating of cells. Excludes the time the specimen is centrifuging and incubating without manual manipulation. Specimen preparation steps are counted separately (see codes 80010-80050). Count once per tissue type.	10.0
81120	Monitoring of growth Includes removing of FDT from incubator, checking for cell growth, and returning to incubator. Count once per FDT, each time it is monitored.	2.0
81160	Feed/Change media Includes aspirating old medium, and/or adding new media. Count once for each FDT fed.	1.0
81200	Subculture Includes removing FDT from incubator, evaluation for growth, create and label new FDT, aspirating old medium, washing and adding enzyme treatment, evaluating quality of enzyme	10.0

Code	Laboratory Activity	Unit Value
	treatment and adding new medium. Count once for each FDT subcultured.	
81230	Addition of special reagent. Use only for the addition of synchronizing/releasing/chelating or anti-contraction agent (e.g. Ethidium bromide) Count once per agent added to each FDT. Add 1 additional workload unit if centrifugation/wash is required to remove the agent.	1.0
81320	Harvesting – manual – cell suspension (e.g. blood, bone marrow) Includes the addition of appropriate reagents and all the hands-on time associated with loading/unloading of centrifuge. Count once per FDT. Add 1 additional workload unit for transfer of sample per FDT.	12.5
81330	Harvesting – manual – monolayer in situ Includes the addition of appropriate reagents and decanting. Count once per FDT.	7.0
81340	Harvesting – manual – monolayer with disaggregation of monolayer cells (e.g. harvesting in suspension) Includes the addition of appropriate reagents and all the hands-on time associated with loading/unloading of centrifuge, and decanting associated with rinsing. Count once per FDT.	15.0
81360	Harvesting – robotic Includes loading and unloading the FDTs and program selection. Count once per FDT. When running the instrument as a test run (e.g. no samples are included), this activity is Non-service Activity (NSR) for maintenance of equipment. Test runs are captured under QC: Equipment maintenance.	1.0
Cytogenetic Examination		
82000	Preparing slide (includes drop slide/ in situ) Includes the reconstitution or dilution of the cell pellet or the	4.0

Code	Laboratory Activity	Unit Value
	removal of excess liquid from the cell monolayer, applying the sample, drying, labelling and assessing the slide and placing the slide for aging. Count once for every slide.	
82040	Routine staining (Banding) Includes microscopic evaluation for quality of the staining. Count once per slide. For per batch method, unit value refers only to the hands-on time and not the waiting time.	2.0
82080	Special staining (e.g. C-banding, NOR, solid stain) Includes the time to perform the staining and microscopic evaluation. (Does not include the time required to prepare the staining solutions – see NSR). Count once per slide. Refer to other schedules (e.g. Anatomical Pathology) for additional staining techniques and associated workload units.	7.0
82120	Destaining Includes removal of oil, coverslip and evaluation for the success of destaining. Count once per slide.	2.0
82160	Manual scanning of slide to select metaphases for examination (e.g. G banding) Count once for every slide scanned. If a slide is scanned completely a second time, count this activity twice.	10.0
82200	Automated scanning of slide to select metaphases for examination Includes loading and unloading of slides and cell selection. Count once for every slide scanned.	4.0
82240	Partial analysis Viewing and analysis to count the number of chromosomes or identification of specific bands, identification of sex chromosomes, noting any gross abnormalities on any chromosome and identifying a few or any specific chromosome(s) (e.g. Philadelphia chromosome). Count once per metaphase analysed.	3.0

Code	Laboratory Activity	Unit Value
	Count only code 82240 or 82270 or 82280. Do not count any of these activities together. Includes annotation and labelling of either printed or digital image of metaphase.	
82270	Complete analysis – normal metaphase Includes all activities related to partial analysis and the identification of all chromosomes and comparing homologous chromosomes band for band and simple numerical abnormalities. Count once per metaphase analysed. Count only code 82240 or 82270 or 82280. Do not count any of these activities together. Includes annotation and labelling of either printed or digital image of metaphase.	8.0
82280	Complete analysis – abnormal metaphase Includes all activities related to partial analysis and the identification of all chromosomes and comparing homologous chromosomes band for band. Applies to abnormalities involving up to 4 chromosome breakpoints. Count once per metaphase analysed. Count only code 82240 or 82270 or 82280. Do not count any of these activities together. Includes annotation and labelling of either printed or digital image of metaphase.	12.0
82320	Complex analysis – complex abnormal metaphase Includes all the activities related to complete analysis. Add 2.0 workload units for each additional structural chromosome abnormality breakpoints involved and/or where increased ploidy is present in a metaphase. Count once per metaphase analysed. Includes annotation and labelling of either printed or digital image of metaphase. If the average time is not reflective of time to perform complex analysis, then laboratories should determine an actual time through performance of a time study and count the workload	Actual or Standard Time as indicated 2.0

Code	Laboratory Activity	Unit Value
	accordingly.	
82360	Image capture (semi-automated) Includes capturing, enhancing and/or printing the image. Count once per image. Includes annotation and labelling of either printed or digital image. If multiple images are captured for fusing to produce 1 image, count 82360 only once (for the final image) and add 2.0 additional units (regardless of the number of images fused).	5.0 2.0
82400	Karyogram Includes examination of an image, identifying chromosomes, comparing bands and producing a complete or composite karyogram with an automated system. Count once per karyogram. For preparation of each karyogram, add additional units from activity 82360. Includes analysis. Do not count 82240 or 82270 in addition to 82400.	20.0
82440	Collation and write up of cytogenetic analysis Includes developing and documenting technical conclusion. Count once per report. If collating a complex analysis, add workload for code 82520.	10.0
82450	Entering results into electronic format Include ONLY if performed by unit-producing personnel (e.g. Technologist). Count once per report.	3.0
82460	Technical checking/reporting – normal report Includes review for levels of resolution <500. Includes reviewing the report for completion, reviewing analysis band for band, and conclusion by a second unit-producing personnel (e.g. Technologist). Count once per report reviewed.	20.0
82480	Technical checking/reporting – abnormal report	26.0

Code	Laboratory Activity	Unit Value
	Includes review for levels of resolution>500. Includes reviewing the report for completion, reviewing analysis band for band, and conclusion by a second unit-producing personnel (e.g. Technologist). Count once per report reviewed. If checking a complex analysis, add workload for code 82520.	
82520	Technical checking/reporting – complex abnormal report Complex karyogram collation or report. Add workload for this activity to codes 82440 and 82480 for the collation or signoff of karyogram involving more than 4 chromosome breakpoints, or more than 2 abnormal cell lines, or where increased ploidy is observed. Count this activity for each of the above abnormalities observed. Count only once per report for each additional cell line involved. Collect only if performed by unit-producing personnel (e.g. Technologist).	15.0
82561	Clinical interpretation and professional signoff- routine Includes the review of the technical report and the correlation with the clinical information to achieve a clinical interpretation. Count only if performed by unit-producing personnel (e.g. Technologist). Exclude if performed by medical personnel.	10.0
82562	Clinical interpretation and professional signoff- complex Includes the review of the technical report and the correlation with the clinical information to achieve a clinical interpretation. Count only if performed by unit-producing personnel (e.g. Technologist). Exclude if performed by medical personnel.	Actual or Standard Time as indicated
Fluorescent In Situ Hybridization (FISH)		
82800	Preparing FISH panel slides (includes multispot slides) Includes CLL panels, Telomere panels, octochrome. Count 4.0 units for every slide prepared Add 0.5 units for each spot.	 4.0 0.5

Code	Laboratory Activity	Unit Value
82900	Pre-hybridization selection and imaging Includes selection and imaging of paraffin embedded, H&E stained cells or areas of interest. Capture this activity only if performed by unit-producing personnel (e.g. Technologist). Exclude if this activity is performed by medical staff (e.g. pathologist, resident). Count once per slide.	30.0
82930	Harvesting uncultured cells from small volumes (<20mls) Includes harvesting cells directly from a sample. Count once per specimen.	11.0
82940	Harvesting uncultured cells from large volumes (>20mls) Includes harvesting cells directly from a sample. Count once per specimen.	15.0
83000	Slide pretreat (enzymatic treatment) Count once for every 4 slides treated.	6.0
83040	Slide denaturation and hybridization Includes the application of probes to the slide or well and placing slide in thermocycler. Count once per slide placed in the chamber and add 0.2 units for each probe(s) applied.	3.0 0.2
83080	Post-hybridization Includes post-hybridization washing of excess fluorochromes, application of counterstain, sealing and coverslip. Count once per slide.	3.0
83120	Manual slide assessment Review of slide to assess the success of hybridization. Count once for each probe.	3.0
83130	Automated slide scanning (e.g. BioView System) Includes loading the instrument, program selection and unloading the instrument, automated accessing and classifying images. Count once per slide.	15.0

Code	Laboratory Activity	Unit Value
83140	Manual classification of cells Use when the automated scanning (e.g. BioView) requires a manual review or cell classification. Includes the manual review of cells automatically classified by the instrument as well as those that are deemed unclassifiable by the instrument. Count once per 100 cells classified.	10.0
83150	Manual slide scanning to find appropriate cells for examination Includes the time to find all the appropriate cells. Count the analysis separately below (codes 83160-83290).	10.0
83160	Analysis – whole chromosome probe Use for metaphase analysis for constitutional or other examination. Count once per 10 metaphases.	10.0
83170	Analysis – locus specific probe – constitutional examination (regardless of the number of loci or fluorochromes) – add workload for code 83150 if appropriate • Metaphase analysis ○ Count once for the first 10 metaphases and 1.0 workload unit for every metaphase thereafter.	10.0 1.0
83180	Analysis – locus specific probe – constitutional examination (regardless of the number of loci or fluorochromes) – add workload for code 83150 if appropriate • Interphase analysis ○ Count once per 10 interphases	2.0
83190	Analysis – locus specific probe – oncology examination – add workload for code 83150 if appropriate Enumeration, micro-deletions or amplifications (may demonstrate fusion and deletions). • Metaphase analysis ○ Count once for the first 10 metaphases and 2.0 workload units for every metaphase thereafter.	20.0 2.0
83200	Analysis – locus specific probe – oncology examination – add workload for code 83150 if appropriate Enumeration, micro-deletions or amplifications (may	2.0

Code	Laboratory Activity	Unit Value
	demonstrate fusion and deletions). • Interphase analysis o Count once per 10 interphases	
83210	Analysis – locus specific probe – oncology examination – add workload for code 83150 if appropriate 2 loci with 2 fluorochromes (double fusion FISH, e.g. BCR/ABL) or break apart probes) (may demonstrate fusion and deletion). • Metaphase o Count once per 10 metaphases.	20.0
83220	Analysis – locus specific probe – oncology examination – add workload for code 83150 if appropriate 2 loci with 2 fluorochromes (double fusion FISH, e.g. BCR/ABL) or break apart probes) (may demonstrate fusion and deletion). • Interphase – count once per 10 interphases. o Normal	2.0
83230	Analysis – locus specific probe – oncology examination – add workload for code 83150 if appropriate 2 loci with 2 fluorochromes (double fusion FISH, e.g. BCR/ABL) or break apart probes) (may demonstrate fusion and deletion). • Interphase – count once per 10 interphases. o Simple abnormal – (<= 4 signals)	3.0
83240	Analysis – locus specific probe – oncology examination – add workload for code 83150 if appropriate 2 loci with 2 fluorochromes (double fusion FISH, e.g. BCR/ABL) or break apart probes) (may demonstrate fusion and deletion). • Interphase – count once per 10 interphases. o Complex abnormal – (> 4 signals)	5.0
83250	Analysis – locus specific probe – oncology examination – add workload for code 83150 if appropriate =3 loci with = 3 fluorochromes.	

Code	Laboratory Activity	Unit Value
	• Metaphase ○ Count once per 10 metaphases.	20.0
83260	Analysis – locus specific probe – oncology examination – add workload for code 83150 if appropriate =3 loci with = 3 fluorochromes. • Interphase – count once per 10 interphases ○ Normal	Actual or Standard Time
83270	Analysis – locus specific probe – oncology examination – add workload for code 83150 if appropriate =3 loci with = 3 fluorochromes. • Interphase – count once per 10 interphases ○ Simple abnormal – (<= 4 signals)	Actual or Standard Time
83280	Analysis – locus specific probe – oncology examination – add workload for code 83150 if appropriate =3 loci with = 3 fluorochromes. • Interphase – count once per 10 interphases ○ Complex abnormal – (> 4 signals)	Actual or Standard Time
83290	For paraffin embedded FISH analysis, add an additional 2.0 workload units to one of the above analysis categories (codes 83160-83280) as appropriate Count once per 10 interphases as appropriate.	Actual or Standard Time As indicated
83350	Probe analysis requiring location of a specific cell/area and correlation of chromosome with cell /tissue morphology Includes the location of the specific metaphase(s). (e.g. Molar tissue, sequential FISH). Count once per 10 cells. Count only code 83150 or code 83350 but not both.	12.0
83360	Manual FISH image capture Includes film or digital capture, enhancement, printing and annotating of an image not associated with automated scanning equipment (e.g. BioView). Do not collect this activity and code 83130 together.	10.0

Code	Laboratory Activity	Unit Value
	Count once per image annotated.	
83370	Karyotyping (e.g. SKY or M-FISH)- constitutional cases Count once per karyogram	27.0
83375	Karyotyping (e.g. SKY or M-FISH)- oncology cases Count once per karyogram.	55
	For collation/write up use code 82440. For technical review/report use code 82480. For complex collation/ report use code 82520. For clinical interpretation and professional sign-off use code 82561 or 82562.	
Microarray		
DNA purification		
83410	Agarose gel electrophoresis Includes gel loading, staining, destaining, and photography as an aggregated value. Count once per lane. For gel preparation see code 02242a in the Non-Service Recipient activity.	0.5
83420	REPLI-g Amplification Kit (Qiagen®) Includes set-up of amplification reaction along with applicable tube labelling, filling out worksheet, Hospital Information System/Laboratory Information System (HIS/LIS) etc. Count once per sample.	Standard or Actual Time
83430	DNA Fragmentation-by Restriction Enzyme Digestion Includes DNA sample aliquotting, dilutions, calculations, filling out worksheet and set up of restriction enzyme digest reaction. Count once per service recipient sample (one service recipient sample includes the tube for the service recipient and for the associated reference DNA).	5.0
83435	DNA fragmentation-by sonication Includes DNA sample aliquotting, dilutions, calculations, filling out worksheet and loading/unloading of sonicator.	9.5

Code	Laboratory Activity	Unit Value
	Count once per service recipient sample (one service recipient sample includes the tube for the service recipient and for the associated reference DNA)	
83440	Fluorochrome labelling without dye swap. May also include heat fragmentation if required. Includes labelling of applicable tubes, filling out worksheets, calculations, labelling reaction set-up and HIS/LIS steps. Count once per service recipient sample (one service recipient sample includes the tube for the service recipient and the associated reference DNA). For dye swap, count unit value twice.	4.0
83445	Microcon®/Amicon® Centrifugal filter purification Includes labelling, aliquotting, discard flow through, pipetting, centrifugation and volume checks. Count once per service recipient sample (one service recipient sample includes the tube for the service recipient and the associated reference DNA).	6.0
83450	Concentration – Microcon® filter Count once per service recipient sample (one service recipient sample includes the tube for the service recipient and the associated reference DNA).	4.0
83455	Concentration – Speed Vac Count once per service recipient sample (one service recipient sample includes the tube for the service recipient and the associated reference DNA).	4.0
83470	Pooling of service recipient and reference DNA Includes calculations. For quantification and specific activity, also count workload for code 85370 (e.g. Nanodrop®).	3.0
83480	Microarray Slide Hybridization and Blocking with CoT-1 DNA Includes blocking solution Prep with CoT-1, placing the gasket in the hybridization chamber, loading the sample, loading the array slide, assembling the hybridization chamber, loading and	3.5

Code	Laboratory Activity	Unit Value
	balancing oven, filling out worksheet. Count once per service recipient sample (one tube).	
83490	Microarray Slide Washing and Drying - Manual Includes washing and drying of slide. Count once per slide/array.	2.0
83495	Microarray Slide Washing and Drying - Automated Includes loading and unloading tasks (E.g. Little Dipper® Microarray Processor). Includes (for each run)-transfer slides to Little Dipper®. Count once per service recipient. Setting up of equipment, cleaning buckets, cleaning slide holder for array, loading buffers, washing solution, and cleaning equipment after each run are non-service recipient activities. See codes 02225 Maintenance of Equipment or code 02242 Reagent Management.	0.4
83501	Microarray Slide Scanning-Agilent® Scanner Includes loading slide into scanner, un-loading slide, computer time and evaluation of scan. Count once per slide.	10.0
83504	Microarray Slide Scanning (E.g. Axon® Scanner, GenePix® 4000B microarray scanner) Includes loading slide into scanner, optimization of settings, computer time and evaluation of scan. Count once per slide.	1.3
83510	Data Preparation Includes transfer of data images into analytical software computer, review quality of data. Count once per service recipient.	8.0
83550	Data Analysis Includes review and analysis of each chromosome, preparation	Standard or actual time

Code	Laboratory Activity	Unit Value
	of preliminary report using analytical software. Count once per service recipient.	
83555	Archiving of data and images Includes the time to create an appropriate folder on the archiving media (e.g. CD or optical disc), burn the data and file the media.	1.0
83560	FISH validation of microarray result For slide preparation see codes 82900-83120. For reading of FISH slide, see codes 83130-83360.	
Cytogenetic - Freezing Tissue		
84500	Freezing of cells with cryopreservation Includes transfer of cell suspension from a flask, disk or tube (FDT) to a freezing vial, cryopreservation (e.g. DMSO treatment), placing the vial in liquid nitrogen, and all the required labelling and documentation. Count once per FDT. If subculture is required, use code 81200.	17.0
84510	Freezing of cells/tissue without cryopreservation	9.0
84520	Thawing of cells and plating Includes retrieval of vial from liquid nitrogen, thawing and plating of cells and incubation in a FDT. Count once per vial.	12.0
Molecular Genetics Specimen Preparation (includes all steps required to produce digested nucleated cells)		
85000	Blood/bone marrow preparation to produce digested nucleated cells for DNA analysis Count once per specimen.	10.0
85020	Fresh or frozen tissue preparation to produce digested nucleated cells. • Includes manual homogenization Count once per specimen.	12.0
85030	Fresh or frozen tissue preparation to produce digested nucleated cells. • Includes mechanical homogenization	8.5

Code	Laboratory Activity	Unit Value
	Count once per specimen.	
85040	Cultured cell preparation to produce digested nucleated cells Count once per sample.	9.0
85050	Direct CVS preparation to produce digested nucleated cells Count once per specimen.	7.0
85060	Buccal swab preparation to produce digested nucleated cells Count once per specimen.	5.0
85065	Saliva preparations to produce digested nucleated cells for DNA analysis (e.g. Oragen) Count once per specimen.	6.0
85070	Blood spot preparation to produce digested nucleated cells Count once per specimen.	6.0
85080	Basic cell selection & scraping of specifically marked cells from tissue slide for loss of heterozygosity studies Includes microscopy time, marking of slides, scraping, hands-on time to load/unload centrifuge and put in buffer. Count once per specimen.	10.0
85085	Complex cell selection & scraping of specifically marked cells from tissue slide for loss of heterozygosity studies For complex cell selection and scraping, requiring a correlation between cells marked on a slide and sequential slides, and special attention to surrounding tissue (e.g. brain tumours). Microscope work includes marking slides, transfer of tissue to unstained slides, deparaffinization. Count once per specimen.	80.0
85100	Deparaffinization of tissue sections Count once per specimen.	9.0
85120	Blood/bone marrow preparation for RNA analysis (e.g. Qiagen, Puregene®) Count once per specimen.	10.0
85160	Preparation of plug for PFGE Includes isolation of white cells from sample, doing cell count, preparation and washing of plug.	15.0

Code	Laboratory Activity	Unit Value
	Count once per specimen.	
85190	Buffy coat isolation Use this activity when preparing samples to be kept as backup. Count once per sample.	1.5
85220	DNA precipitation Use this activity when purifying or concentrating DNA prior to assay. Count once per sample.	5.0
Extraction of Nucleic Acid		
85300	Manual extraction Includes Phenol/Chloroform or salt extraction. Includes up to 2 phenol steps and one chloroform step. If an extra chloroform step is required, add 7.1 units. Count once per specimen.	11.0 7.1
85320	Extraction using a manual kit (e.g. ArchivePure, Puregene®) Count once per specimen.	10.0
85340	Extraction using an automated kit (e.g. Qiagen) Includes loading samples on instrument, programming of instrument related to samples, labelling tubes and aliquotting of sample. Note: Instrument setup including temperature checks, loading tips, reagents volumes calibration should be collected as non-service recipient workload (see code 02225). Count once per specimen.	2.0
85360	Manual nucleic acid quantitation Includes any applicable diluting, pipetting and tube labelling and measuring using a fluorometer or a spectrophotometer. Count once per specimen.	5.0
85370	Nucleic acid quantitation using a spectrophotometer with sample retention technology (e.g. Nanodrop®) Count once per specimen.	1.0
PCR Reactions		

Code	Laboratory Activity	Unit Value
85500	Assay preparation – manual worksheet preparation Includes worksheet preparation, manual calculations for DNA/Reagent/water dilutions, retrieval and verifying specimen and labelling of tubes, loading thermocycler, programming thermocycler with specimen location, loading and unloading thermocycler. Count 3.0 units for each assay and 1.0 per specimen.	2.0
85530	Assay preparation – electronic worksheet preparation Includes electronic worksheet preparation, electronic or manual calculations for DNA/Reagent/water dilutions, retrieval and verifying specimen and labelling of tubes, loading thermocycler, programming thermocycler with specimen location, and unloading thermocycler. Count 2.0 units for each assay and 1.0 per specimen.	1.0
85560	Dilution of specimens (at the assay stage only) Includes manual calculations required for the dilution, pipetting and labelling (e.g. diluting for breast cancer) Count once per specimen.	2.0
85590	Preparation of DNA master plate/strips for subsequent procedures Includes making a master list and pipetting into master plate. Count per specimen.	0.5
85620	Preparation of secondary plates/strips. Includes labelling and pipetting from primary to secondary plate/strip. Count once per specimen.	0.5
85650	Manual preparation of master mix for any type of reaction – up to 8 separate reagents (multiple primers in a single solution constitutes a single reagent) Includes master mix preparations for PCR, PTT, RT PCR, Sequencing reaction, and dHPLC. Count once per master mix prepared.	5.0
85680	Manual preparation of complex master mix – more than 8 separate reagents (multiple primers in a single solution constitutes a single reagent)	7.0

Code	Laboratory Activity	Unit Value
	Includes complex master mix preparations for PCR, PTT, RT PCR, Sequencing reaction, and dHPLC. Count once per master mix prepared.	
85710	Preparation of master mix using liquid handling system (automated) Count once per master mix prepared.	4.0
85730	Radioactive master mix This activity is intended to account for the extra time required to prepare a master mix using radionuclides. Count this activity in addition to codes 85650 or 85680.	3.0
85740	Aliquotting of specimen and master mix Includes labelling plates/tubes. Count once for each two pipetting activities (specimen and the master mix) (see definition below). If adding a third reagent to the reaction tube (separately from the master mix), add an additional 0.2 workload units.	0.5 0.2
85800	Aliquotting of specimen/master mix using liquid handling system Includes labelling plates/tubes, set up (programming), loading and unloading of specimen and pipette tips. Count once per master mix or service recipient set up.	8.0
	Definition: *A pipetting activity includes one pipetting sequence and includes loading the pipette tip(s), aspirating a liquid, dispensing the liquid, rinsing the pipette tip(s) (if applicable) and disposing of the pipette tip(s). A pipetting sequence includes all the pipetting tips used on a multi-channel pipettor.*	
85830	Purification of PCR product (pre-sequencing reaction) using a column Count once per purification.	2.0
85860	Purification of PCR product (post-sequencing reaction) using: • a column Count once per sample.	20.0
85870	Purification of PCR product (post-sequencing reaction) using: • a kit (E.g. ABI, Exterminator) Count once per sample.	1.0

Code	Laboratory Activity	Unit Value
85880	Purification of PCR product (post-sequencing reaction) using: • Ethanol precipitation Count once per sample.	3.0
85890	Sodium bisulfite treatment	10.0
	Loading of the thermocycler is included in codes 85500 or 85530.	
	Special instructions: *For Protein Truncation Test, reverse transcriptase PCR, real time PCR and other PCR reactions, use the appropriate codes for assay preparation (codes 85500–85530), dilution of specimen (code 85560), master mix preparation (codes 85650–85710), aliquotting (codes 85740–85800) and any other appropriate code.*	
85950	Denaturation/Heteroduplex formation Includes mixing of sample with controls and programming temperature blocks. Count once per specimen.	2.0
Nucleic Acid Detection		
87000	Electrophoresis Includes loading of specimen and electrophoresis of gel, adding dye, attaching electrodes and setting voltage to power pack. Applies to agarose and polyacrylamide gels. Count once per lane loaded. For gel preparation see code 02242a in the non-service recipient activity section in the schedule of unit values.	0.5
87020	Loading of plugs into PFGE system Includes cutting of plugs, insertion into gel and topping with melted agarose. Count once for each lane loaded.	2.0
87040	Gel staining Applies to agarose and non-sequencing polyacrylamide gels and PFGE gels. Count once per gel stained.	2.0
87042	Gel staining with silver stain	TBD

Code	Laboratory Activity	Unit Value
	Applies to agarose and non-sequencing polyacrylamide gels and PFGE gels. Count once per gel stained.	
87080	Destain Count once per gel destained.	2.0
87120	Capillary electrophoresis Includes preparing sample injection list, loading, program selection and unloading of instrument. Excludes units for sample dilution, master mix preparation and pipetting which are captured under other codes. Count once per specimen.	2.5
87160	Denaturing high performance liquid chromatography (dHPLC) Includes loading samples, computer program selection and unloading of samples. Excludes units for sample dilution, master mix preparation and pipetting which are captured in code 85740. Count once for up to 96 well plate.	Refer to the clinical chemistry section
87190	Photography- print or digital. Includes taking a number of exposures or digital pictures and labelling of print or digital image. Count once per image.	6.0
Analysis of PCR Assays Includes the collation, technical interpretation and write up of data and entering in LIS.		
87500	Gel photography analysis Includes interpretation for Gel Documentation system, Digital Imaging analysis. Count once per sample.	1.0
87510	Autoradiography analysis Includes interpretation of autoradiograph. If gel drying is required, add 0.5 workload units per gel. Excludes capturing and labelling of autoradiograph (see code 88300). For manual preparation of a size curve, see code 88320.	5.0 0.5

Code	Laboratory Activity	Unit Value
	Count once per sample.	
87580	Genotyping Includes analyzing results against size standard, adjustment of image, printing, and collating data. Count once per genotype.	4.0
87590	Mulitplex ligation dependent probe amplification (MLPA) – all inclusive without methylation Count once per amplicon. Includes all the steps involved for MLPA, such as worksheet preparation, calculations, master mix preparation, specimen dilution, aliquotting, amplification, detection of amplicons, and analysis of peak patterns. Do not count any of these activities separately. Excludes the sample preparation steps (codes 85000 – 85220), collation (code 87760), technical checking (code 87771) and clinical interpretation (code 87780). Count these activities separately. MLPA- all inclusive with methylation ○ When methylation is required as part of MLPA (e.g. Prader-Willi or Beckwith-Wiedemann), add 5.5 workload units to code 87590	14.0 5.5
87630	Sequencing for specific variant Includes manually bringing data into sequencing software, aligning sequence with reference and scanning sample for variant as well as manual verification of variant(s). Count once per amplicon. Count once each for forward or reverse sequence. Each time a sequencing product is produced, count using the base unit of amplicon. When pulling a number of sequences together for comparison or for large fragments with multiple amplicons, count the unit value and 2.5 additional units for each additional amplicon included in the comparison.	2.5 for each direction 2.5 for additional amplicons
87700	Automated analysis (e.g. Invader Technology®) Includes any of the above analysis when performed by software with minimal intervention by unit-producing personnel. Count once per specimen.	1.0

Code	Laboratory Activity	Unit Value
87740	Data analysis for dHPLC Includes the effort required to analyse and interpret the curves, graphs and other data generated by the above processes. Count once per specimen.	3.0
87750	Data analysis for real time PCR (quantitative and/or qualitative) Includes the effort required to analyse and interpret the curves, graphs and other data generated by the above processes. Count once per specimen.	8.0
87760	Collation and write up of molecular genetic analysis Includes evaluation of clinical data, family files, history and testing data to arrive at a technical conclusion. Count once per report: • Simple report – (straightforward interpretation with minimal research required e.g. hemochromatosis) • Intermediate complexity – (requires some interpretative analysis and some research e.g. Huntington) • Complex report – (requires significant amount of time to interpret and/or extensive research to determine significance of findings e.g. breast cancer) Count only if performed by unit-producing personnel.	2.0 10.0 50.0
87771	Technical checking/ reporting of molecular genetic interpretation Includes reviewing the report for completion, reviewing analysis and conclusion by a second unit-producing personnel. Count once per report reviewed. • Simple Count only if performed by unit-producing personnel.	5.1
87772	Technical checking/ reporting of molecular genetic interpretation Includes reviewing the report for completion, reviewing analysis and conclusion by a second unit-producing personnel. Count once per report reviewed. • Intermediate Count only if performed by unit-producing personnel.	15.0

Code	Laboratory Activity	Unit Value
87773	Technical checking/ reporting of molecular genetic interpretation Includes reviewing the report for completion, reviewing analysis and conclusion by a second unit-producing personnel. Count once per report reviewed. • Complex Count only if performed by unit-producing personnel.	52.0
87775	Entry of canned comments into electronic system (E.g. HIS/LIS or independent database). Includes accessing the service recipient's file and entry of any number of canned comments. Count only if performed by unit-producing personnel.	0.3
87780	Clinical interpretation and professional signoff Includes the review of the technical report and the correlation with the clinical information to achieve a clinical interpretation. Count only if performed by unit-producing personnel. Exclude if performed by medical personnel.	Actual or Standard Time
Southern Blot		
88000	Enzyme digestion Includes aliquotting of sample and enzyme master mix. Count once per specimen. Use code 85740 for aliquotting of the specimen and master mix. Also include other activities such as 88040, 88080, 88120, 88160, 88240, 88280 as appropriate	Use master mix and aliquotting unit values
88040	DNA transfer – Includes preparation of gel, setting up and taking down capillary transfer of DNA from gel and neutralizing membrane, fixing DNA on membrane. Includes checking gel for purposes of photography. • Capillary method Count once per gel.	30.0
88080	DNA transfer – Includes preparation of gel, setting up and taking down capillary transfer of DNA from gel and neutralizing membrane, fixing DNA on membrane. Includes checking gel for purposes of photography.	30.0

Code	Laboratory Activity	Unit Value
	• Vacuum method Count once per gel.	
88120	Probe hybridization Includes adding pre-hybridization, hybridization solutions, and washing. Count once per membrane.	20.0
88160	Oligolabelling/end labelling Count once per labelling reaction.	15.0
88240	Removal of unincorporated isotope using: • Gravity column (per labelling reaction)	5.0
88280	Stripping of membrane in preparation to re-probe membrane/blot Count once per membrane.	10.0
88300	Autoradiography Includes loading cassette, developing and labelling the film. Count once per film.	8.0
88320	Manual preparation of size curve from autoradiograph Includes manual preparation of size curve. Count once per size curve.	5.0
88325	Automated preparation of size curve from autoradiograph. Includes the input of the numbers and the curve is generated electronically. Count once per size curve.	6.0
Miscellaneous		
88510	Referring out samples – includes preparation of appropriate documentation, including pedigree and consent forms and supporting documentation. Count once per service recipient. Use code 11090 for packaging and shipping = 1 workload unit.	11.0
88520	Receiving sample from other centre Includes review of and completion of appropriate documentation including pedigree, consent forms and supporting documentation.	3.0

Code	Laboratory Activity	Unit Value
	Consider also collecting workload for registration of service recipient in HIS/LIS (see codes 11500–11550). Count once per service recipient.	
88550	Creation of family/service recipient folder Includes computer work to add sample to an existing family folder or assigning a new number and retrieving or making a new folder. Count once per folder.	5.0
88600	Preparing a pedigree, obtaining further information and/or other samples, and the suitability of testing based on clinical/family history.	10.0

Non-Service Recipient Activity List

Non-service recipient activities are unit-producing personnel activities that are integral to the functional centre's operations, but do not involve the delivery of services to service recipients. Any activity in this list can be utilized by any clinical laboratory functional centre if the unit value is accurate and reflective of the realistic average time required to perform a specified activity.

Collect non-service recipient activity workload ONLY when activities are performed by unit-producing personnel.

There are four non-service recipient activity workload categories—functional centre activities, organizational/professional activities, teaching/in-service and research. Additionally, there are three sub-categories for certain laboratory disciplines including Transfusion Medicine, Electron Microscopy and Clinical Microbiology.

The following table lists the types of activities that are typically considered non-service recipient activities in the clinical laboratory functional centres. As with service recipient activities, non-service recipient workload units are recorded by unit-producing personnel only.

Items for Count

For the purposes of recording clinical laboratory workload, users should refer to the definitions of the items for count provided in this section. The item for count for service recipient activities is "laboratory intervention" whereas; the item for count for non-service recipient activities may be occurrence, activity or round trip.

Occurrence
An event or incident that happens or takes place at an instance or point in time.

Activity
Performing a specific function or duty.

Round Trip
Travel from the clinical laboratory functional centre to a remote/distant/satellite site, and the return trip.
Certain non-service recipient activities may be of particular interest to the functional centre manager. For example, organizations that are involved in a lot of travel "to and from the place where the service recipient activities are provided" may want to report this travel separately. Similarly, clinical laboratories that are particularly interested in tracking the quality control, or equipment maintenance activities may want to collect and report this data separately.

Quality Control:
The conceptual model categorizes quality control as a non-service recipient activity (see activity 02252). Conceptually, the quality control that can be performed for multiple analyses (multiple service recipients) is considered as non-service recipient workload. By capturing this workload as non-service recipient activity, when costing analysis is performed, the workload (and associated human resources expenses) are spread amongst all the tests performed (i.e. overhead costs) for all the service recipients.

There are two approaches to determine the workload for quality control:
a) Determine all the activities listed associated with workload and develop an aggregate unit value.
b) Determine the average workload for the test in question and assign the average workload to the quality control sample.

The above applies to all the quality control that can be performed for multiple samples. For example, calibration samples, commercial accuracy controls, or laboratory samples for precision should all be considered as non-service recipient activities.

Auto-controls, or controls that require the service recipient's own sample to measure the internal reaction, are controls that are unique to the service recipient. In other words, the auto-control cannot be used for multiple service recipients. Examples may include a service recipient's serum for auto-fluorescence, or auto-agglutination. Because these auto-controls are unique to the service recipient, the workload associated with these auto controls should be considered service recipient activities

and captured in the same category and type of service recipient as the test itself. For any of these repeated tests, count the workload again.

If the patient test is repeated solely as a quality control initiative, not including auto-controls as mentioned above, and not for the service recipient's specific health care needs, then it is counted as non-service recipient workload (see activity 02252). This scenario would include repeats performed for calibration samples, commercial accuracy controls, or laboratory samples for precision should all be considered as non-service recipient activities. The conceptual model categorizes quality control as a non-service recipient activity. The workload is usually assigned by referring to the appropriate service recipient section in the schedule of unit values and assigning a unit value based on the published average time workload unit for that activity. Another option is to use standard or actual time to assign workload quality control activities.

Code	Activity	Unit Value	Item for Count
Functional Centre Activities			
02205	Functional Centre Management Includes housekeeping/clerical activities; organizing; orienting personnel; recording and calculating workload and other statistical data; recording payroll and scheduling data, non-clinical documentation, incident reporting; compiling data for reports and management purposes; management activities related to discipline specific activity; development of discipline specific service programs, and oversight of quality control programs and participation in quality improvement activities. • Eg. procurement of new equipment	Actual or Standard Time	Each Occurrence
02210	Employee Meetings Includes formal and informal meetings of functional centre staff for the purpose of disseminating and receiving information pertaining to the operation of the functional centre and the organization.	Actual or Standard Time	Each Occurrence
02215	Caseload Management Includes prioritization and assignment of service recipients within a caseload, and managing unit-producing personnel's various tasks associated with the caseload.	Actual or Standard Time	Each Occurrence
02220	Maintenance Includes, but not limited to, activities such as maintaining a safe, tidy environment and activities related to inventory control (e.g. ordering, stocking, receiving, storing etc).	Actual or Standard Time	Each Occurrence

Code	Activity	Unit Value	Item for Count
02225	Maintenance of Equipment Includes: • maintenance and cleaning of equipment (e.g. analyzer, microscope, automated coverslipper, automated stainer, POCT) • repair of laboratory equipment • decommissioning of instrumentation Collect this workload ONLY when performed by unit-producing personnel.	Actual or Standard Time	Each Activity
02228	PPE (Personal protective equipment) - includes donning and doffing for the purposes of preventing contact with biohazardous materials during equipment/laboratory maintenance activities only. Includes the following: • Gloves • Gown • Mask • Face shield/Visor • Boot/shoe covers Note: Do not collect this workload for donning/doffing lab coats, gloves for standard universal precautions during regular specimen procurement and handling since this workload is factored into every laboratory activity. See code 10090 for special precautions to enter/exit isolation rooms.	0.5 2.0 0.5 0.5 1.0	
02230	Troubleshooting of Equipment Includes activities related to determining the cause of error codes or malfunction of equipment verification of adequate repairs made and documentation of downtime.	Actual or Standard Time	Each Activity
02231	Device/Instrument Evaluations Includes activities associated with the evaluation of new technologies or repaired existing instrumentation, compiling and analyzing data, and report writing.	Actual or Standard Time	Each Occurrence
02232	Device/Instrument Selections Includes activities associated with the selection of new technologies, multidisciplinary groups, implementation of new	Actual or Standard Time	Each Occurrence

Code	Activity	Unit Value	Item for Count
	technologies, compiling and analyzing data and report writing		
02233	Device/Instrument Validations Includes activities associated with the validation of existing devices or repaired devices. Examples would include validating a new glucose meter or blood gas analyzer that are replacing devices removed from service or validation of repaired devices and compiling and analyzing data, report writing	Actual or Standard Time	Each Occurrence
02235	Hospital Information System/Laboratory Information System (HIS/LIS) and Equipment Interfaces Maintenance Includes time spent updating system with new information (e.g. workload codes and units, new tests), software maintenance, HIS/LIS purges, and self-test activities.	Actual or Standard Time	Each Occurrence
02240	Troubleshooting of Hospital Information System /Laboratory Information System (HIS/LIS) and Equipment Interfaces Includes activities related to determining the cause of error codes or malfunction of HIS/LIS or equipment interfaces.	Actual or Standard Time	Each Occurrence
02242	Reagent Management Includes time spent: • preparing and reconstitution of reagents/solutions/media (e.g. stains, stock, testing reagents, media preparation from dried powder/reconstitution/pre-reduction) • loading reagents on to instrument • filtering and discarding of solutions/reagents • checking adequacy of reagents/solutions • evaluating new reagents • aliquotting of bulk reagents • sterilization of supplies • CJD bleach • preparation of probes • red cell preparation and all associated documentation of reagents/solutions/media/organisms • preparation, (reconstitution, if necessary) and aliquotting of commercial QC material.	Actual or Standard Time	Each Occurrence
02242a	Preparation of gels for electrophoresis (for use with agarose and polyacrylimide gels). If preparing gels singly (one gel / time), count once per gel prepared. If preparing gels in batches, count once per casting apparatus. For example, if the casting apparatus allows the preparation of	10	

Code	Activity	Unit Value	Item for Count
	10 gels at a time, each gel may be assigned 1.0 workload units.		
02242b	Plate preparation for Tandem Mass Spectroscopy – per plate This includes the preparation of internal standards and plate preparation.	45	
02242c	Production of dry ice (siphoned to preparation), per block Count only if the dry ice is produced on site and not ordered from a supplier.	8.0	
02243	Autoclaving, per batch Includes programming, loading and emptying of the autoclave. Count once for each complete autoclave cycle. Note that each autoclave run is considered a batch regardless of the contents.	12.0	
02244	Documentation for Release of Specimens Includes the documentation required for legal purposes or related to the release of specimens to peace officers or coroner's offices. Collect this workload ONLY when performed by unit-producing personnel.	Actual or Standard time	Each Occurrence
02246	Laboratory Specific Clerical Activities Includes activities such as but not limited to booking of appointments, filing/archiving of slides and requisitions, retrieval and filing of slides for teaching, QC, etc., general phone calls/inquiries. Collect this workload ONLY when unit-producing personnel perform clerical duties above their technical duties	Actual or Standard Time	Each Occurrence
02250	Quality Management Includes time spent attending quality management meetings; performing and documenting activities that improve the quality of services delivered commensurate with functional centre policy, industry and accreditation standards. Includes: • performing peer evaluations or assessments • drafting, revising and reading standard operating procedures • laboratory accreditation • performance of audits that are internal and external to the clinical laboratory (example – specimen rejection rates, turnaround times, mislabelled specimens)	Actual or Standard Time	Each Occurrence

Code	Activity	Unit Value	Item for Count
02252	Quality Control Includes: • analysis of calibration standards • analysis of QC sample results • flow cytometry bead calibration • external proficiency testing samples • inter-laboratory comparisons • SOP reviews (standard of practice) • **For the assignment of unit values for quality control purposes, users may refer to the appropriate service recipient section in the schedule of unit values and assign a unit value based on the published average time workload unit for that activity.* Note:If the patient test is repeated solely as a quality control initiative, and not for the service recipient's specific health care needs, then it is counted as non-service recipient workload, This includes repeats performed for calibration samples, commercial accuracy controls, or laboratory samples for precision, etc. Conceptually, quality control that can be performed for multiple analyses (e.g. multiple service recipients) is considered as non-service recipient workload.	Actual or Standard Time*	Each activity
02254	Quality Assurance Checks Includes activities such as but not limited to: • confirmation/validation of staining • validation/documentation of temperature checks • checking fridge and freezer alarms • laboratory log documentation • printing outstanding worklists to search for missed analyses • HIS/LIS searches for reports/results not received from referral laboratories • spot checks for slide making • rescreening of slides for QA using imaging systems • wipe or swipe testing for detection of DNA contamination • sorting of labels • manual/HIS/LIS-Other cytology/histology correlations Collect this workload ONLY when performed by unit-producing personnel.	Actual or Standard Time	Each activity
02256	Risk Management and Patient Safety	Actual or Standard Time	Each activity

Code	Activity	Unit Value	Item for Count

	Includes:
	• activities related to the management of an occupationally safe environment
	• incident reporting and investigation
	• activities such as safety procedures:
	  • bench cleaning
	  • receipt, monitoring, clean up and waste management of radioisotopes
	  • participation in safety inspections and audits
	Collect this workload ONLY when performed by unit-producing personnel.		

02264	Utilization Management Includes the time spent documenting all activities related to utilization management of laboratory services (e.g. utilization of blood products, tests or application of utilization guidelines). Collect this workload ONLY when performed by unit-producing personnel.	Actual or Standard Time	Each Activity
02272	Discard of Specimens Includes the disposal and all associated documentation.	Actual or Standard Time	Each Occurrence
02280	Travel Includes travel internal or external to the health care facility (e.g. to another site, campus) associated with the functional centre activities listed above as well as travel associated with the provision of services (e.g. collection of biopsies, FNAs, bone marrow collection, phlebotomy) to specific service recipients within the organization but external to the laboratory environment itself. Count only for unit-producing personnel in performance of the functional centre's activities. Workload for laboratory activities requiring routine travel within the laboratory itself (e.g. from one bench to another, or from one laboratory section to another section within the laboratory) is factored into the unit values and is not counted again.	Actual or Standard Time	Each Round Trip
Transfusion Medicine			
02282	Inventory Management of Blood and Blood Products Includes time spent receiving products for inventory, performing visual inspections, storage of products,	Actual or Standard Time	Each occurrence

Code	Activity	Unit Value	Item for Count
	preparation/packaging of blood/blood products for transportation for inter-facility inventory, inventory retrievals and sequestering, routine ordering, special ordering (e.g. emergency, special type) and all associated documentation.		
02284	Analysis of Samples for inventory (e.g when unit is intended for inventory without being designated to a particular individual) • ABO & RH Grouping of red cell units • high titre Anti-A, Anti-B and Anti-A,B testing of pooled buffy coat platelets	Actual or Standard Time	See TM Schedule of Unit Values
02286	Blood Conservation Program Includes all documentation related to blood conservation. (e.g. Cell Saver , Transfusion Safety Officer role, meetings, conferences, normovolemic hemodilution, guideline development and related in-services) Collect this workload ONLY when performed by unit-producing personnel.	Actual or Standard Time	Each Occurrence
Electron Microscopy			
02290	• preparing glass knives • maintaining liquid nitrogen • cleaning and maintenance of electron microscope • preparing Formvar grid	Actual or Standard Time	Each Occurrence
Clinical Microbiology			
02292	• freezing of organisms • freeze drying/lyophilization of organisms • enrichment of media (blood culture, antibiotic, discs to carrot broth) • virology cell culture maintenance – continuous or purchased • sterility testing of instruments (example – dialysis machines) • entry/exit into level 3 environment	Actual or Standard Time 10	Each Occurrence
02293	Special atmosphere jar/bag with gaspack (e.g. anaerobic or microaerophilic) Includes the time to prepare the special atmosphere (e.g. jar/bag) and to place the jar/bag in the incubator. Count once per jar/bag. See Code 02225- Maintenance of Equipment for cleaning the atmosphere jar/bag.	1.1	

Code	Activity	Unit Value	Item for Count
02294	Anaerobic chamber – using the passbox only Includes the "hands-on" time to evacuate the antechamber and fill the antechamber. Count once for each loading or unloading of the chamber, regardless of the number of plates/racks incubated.	1.8	
02295	Anaerobic chamber – full entry/exit of the chamber Includes the "hands-on" time to evacuate the antechamber and fill the antechamber. Count once for each loading or unloading of the chamber, regardless of the number of plates/racks incubated.	4.5	
02296	Anox incubation Includes loading the jar/chamber with plates/catalyst, hooking up the gas line, pushing the button (cycle time) and removing the jar to the incubator. Count once per jar. See Code 02225- Maintenance of Equipment for cleaning the jar/chamber.	1.1	
Organizational/Professional Activities			
02305	Board/Committee Functions Activities performed during worked hours relating to the preparation, attendance and follow-up of health service organization board/committee functions.	Actual or Standard Time	Each Occurrence
02310	Program Management Management activities related to multidisciplinary program(s) and program management activities related to the organization as a whole.	Actual or Standard Time	Each Occurrence
02315	Public Relations Activities directly associated with the public relations function of the health service organization. Includes, but not limited to planning, meetings and participation in the event, e.g. Media interviews, information programs, preparing articles.	Actual or Standard Time	Each Occurrence
02320	Advocacy-Professional Activities Includes services provided to the professional, scientific and local communities, agencies and service groups during worked hours.	Actual or Standard Time	Each Occurrence

Code	Activity	Unit Value	Item for Count
02325	Travel Includes any travel associated with organizational/professional activities.	Actual or Standard Time	Each Round Trip
Teaching/In-Service Activities			
02405	Teaching of students Activities associated with the preparation, orientation, instruction, supervision and/or evaluation of students either prior to, during, or immediately following their clinical placements. Excludes service recipient activities, which are provided as part of the research program. These activities are recorded in the appropriate category under service recipient activities.	Actual or Standard Time	Each Occurrence
02410	Teaching of professionals Activities involved in the preparation, orientation, presentation and/or instruction of health service organization personnel.	Actual or Standard Time	Each Occurrence
02415	Academic teaching Activities involved in the preparation and presentation of course/lecture material to students, evaluation of students as part of their academic curriculum.	Actual or Standard Time	Each Occurrence
02420	In-service education Includes receiving brief, usually in-house educational information presented by health service organization staff, orientation to new procedures or equipment, grand rounds, and reading of professional articles, journals and books. Includes orientation and training of new staff.	Actual or Standard Time	Each Occurrence
02425	Travel Includes any travel associated with teaching/in-service activities.	Actual or Standard Time	Each Round Trip
Research Activities			
02505	Research Project Formally designed and approved clinical investigations directed toward advancing knowledge in the field of health, and delivery of health services using recognized methodologies and procedures. All activities performed during worked hours such as reviewing previous research, writing research proposals, compiling and analyzing data and report writing are included. Excludes service recipient activities, which are provided as part	Actual or Standard Time	Each Occurrence

Code	Activity	Unit Value	Item for Count
	of the research program. These activities are recorded in the appropriate category under service recipient activities.		
02510	Travel Includes any internal or external travel associated with research activities.	Actual or Standard Time	Each Round Trip