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Canadian Workload Measurement System — Laboratory

A Schedule of Unit Values for Clinical Laboratory Procedures

1985-86 Edition

Please use this manual
until there are sufficient amendments
to justify a new edition

Canada

Statistics Canada
Health Division
Institutional Statistics Section

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Clinical Laboratory Procedures

1985-86 Edition

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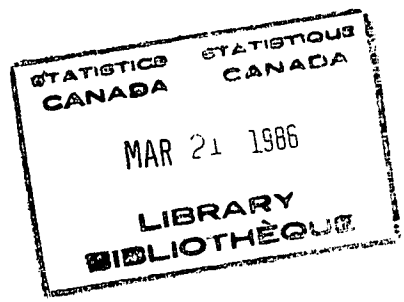

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PREFACE TO THE 1985-86 EDITION

This edition of the Schedule of unit values for clinical laboratory procedures has been reorganized and contains many new unit values. Since the 1982-83 edition the disciplines of Microbiology, Histology, Cytopathology, Cytogenetics and Immunohematology have been extensively retimed and some change and additions to the already revised Chemistry and Hematology sections have been included. **All the information should be treated as new and care taken to ensure that all those with responsibility for data collection and analysis have access to the complete manual.** Each unit value currently in use should be verified and collection forms reviewed for suitability.

One of the major outputs of the Workload Measurement System is the production of interprovincial comparisons of laboratory activity. The value of these comparisons has been compromised by the past practice of allowing local assignment of unit values to procedures not listed in the schedule. The cessation of this practice is considered the first fundamental step towards the production of clean data for comparisons. For the future it is desirable that a full auditing service be made available but for now laboratories are instructed only to record unit values which are listed in the 1985-86 edition or have been assigned an official temporary unit by the Workload Measurement Committee. **No unit values are to be assigned independently.** A summary of new temporary unit values will be promulgated via a Newsletter.

Requests pertaining to established and temporary unit values should be made in writing and contain a detailed description of the procedure (see **Appendix A,** Form 6). These requests should be directed to:

Canadian Association of Pathologists
Laboratory Workload Measurement
Secretariat
222 St. Patrick Street
TORONTO, Ontario
M5T 1V4
Telephone: (416) 596-3141

Questions relating to the reporting of data in the Annual Return of Health Care Facilities - Hospitals and the Quarterly Hospital Information System should be directed to:

Institutional Statistics Section
Health Division
Statistics Canada
OTTAWA, Ontario
K1A 0T6
Telephone: (613) 990-8568

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INTRODUCTION

The effective management of any resource requires the analysis of current activities, a review of past experience and the projection of future trends. In the hospital laboratory, the Workload Measurement System contributes to this process by providing a standard measure for that portion of human resources which is directly responsible for the production of patient answers. Properly used in conjunction with other information, it can aid in decision making regarding staffing, equipment purchase, space allocation and laboratory utilization. It may be used in conjunction with financial information although it is not a complete cost accounting system. The unit value is not influenced by such things as supply costs and depreciation. However, it is currently used to a greater or lesser extent for the deployment of laboratory resources. For this reason, methods of audit to enhance the credibility of the system are under consideration.

HISTORY

Hospitals in Canada have submitted annual records of their activities to Statistics Canada since 1931. However, it was not until the 1950's that an attempt was made to standardize the measurement of technical workloads.

In the Laboratory Workload Measurement System each procedure is assigned a unit value which represents a measure of the **PERSONNEL resource** required to perform that procedure once. Workload units in laboratory medicine were first used in Canada by the Laboratories Branch of the Ontario Ministry of Health and the Department of Veterans Affairs Laboratory Services. The Units were based on a System developed in the United Kingdom in the 1940's in which one unit was equal to 10 minutes of time consisting of 7 minutes technical and 3 minutes support time. On the recommendation of a Sub-committee of the Technical Advisory Committee on Public Health Laboratory Services, Statistics Canada began using this system to collect laboratory units in 1954.

In 1965, the Canadian Association of Pathologists received a National Health Research and Development grant from the Department of National Health and Welfare to produce new units based on standard time studies. Contacts were established across the country allowing for input from specialists in all laboratory disciplines. Time study protocols were developed for common high volume procedures and time studies were carried out in 50 hospitals. At this time the group also formulated goals and objectives for maintaining a dynamic system which would best serve the majority of users. As a result of this project, the unit was restructured to represent one minute instead of 10 and the concept of "productive time" was introduced and defined. Statistics Canada published the first unit values derived from actual timed measurements in 1969. Since then the manual has been updated from time to time. In order to preserve standardization, the principles set down in the 1960's have remained the framework within which any new studies have been undertaken.

CURRENT STATUS

Today workload measurement systems exist or are under development in many hospital related disciplines. The Canadian Association of Pathologists Workload Measurement Committee is responsible for the development and maintenance of the Laboratory System. The current membership of this committee is listed in **Appendix D** of this book. Members of this Committee act as chairmen for discipline specific sub-committees whose composition reflects the major laboratory professional associations and a wide geographical spread across the country. In addition one must acknowledge the invaluable contribution of hundreds of professionals whose laboratories have participated in time studies and information surveys. An extra dimension to the laboratory Workload Measurement System is its liaisons with other countries which have adopted the Canadian method. The most active liaison is with the College of American Pathologists who published the first American manual in 1970 based largely on Canadian data. Today the two organizations share a common philosophy and approach to time studies. Data are often shared and the manuals are very similar in content although each reflects the unique requirements of each country.

This edition of laboratory unit values incorporates extensive revisions based on time studies performed over the past 3 years. Retiming was necessary because gains in efficiency, primarily due to automation of the laboratory, led to inflation of unit values and many procedures in the 1982-83 edition were overvalued. These studies were carried out by the full time Secretariat staff based at the Toronto Institute of Medical Technology.

It is recognized that not every laboratory activity has been time studied and assigned a unit value in this schedule. Time spent on important functions of the clinical laboratory (eg. education, administration and method development) are not included.

Although the time studies resulting in the assigned unit values were carried out in laboratories of various size and complexity across the country, they are still only averages. Nevertheless, the aggregate unit values generated by a clinical laboratory yield more information about workload than a simple tally of tests of diverse complexity and represent the best available management tool for laboratory directors, hospital administrators and ministries of health.

TIME STUDIES AND THE DERIVATION OF UNIT VALUES

The cornerstone of the Workload Measurement System is the **UNIT.** The use of this defined interval allows the quantitation of human resources directly relating to patient service. There are other functions associated with the laboratory such as teaching, research and method development but these are major considerations for only some institutions. Patient service is the one thing that all hospital laboratories have in common.

When developing time study protocols the intent was to identify and record the time spent on activities specifically related to the production of patient answers, hence the definition of a unit as "one minute of the productive time of technical, clerical and lab aide staff". This term has been misinterpreted when given the connotation that time that is "not productive" is wasted. This is not the case in the context of the Workload Measurement System.

Activities which are measured have historically been listed under 8 broad headings or fields.

Today these basic fields are commonly still used in Chemistry and Hematology but often will be modified in other disciplines to capture special kinds of activity (eg. Photography in Cytogenetics). The method of time study is flexible enough to accommodate the deletion or re-definition of any field found not pertinent to the procedure being evaluated.

The eight fields are:

1. **Initial Handling** covers the specimen from its arrival in the laboratory to the completion of all preliminary preparation and recording required before testing can begin:

- time stamping requisitions
- sorting specimens
- recording patient I.D.
- assigning a laboratory number
- logging on a worksheet
- separating serum from cells

2. **Specimen Testing** covers the performance of the procedure up to and including the first recording of a result:

- diluting the specimen
- adding reagents
- monitoring the measuring instrument
- placing the test material in the instrument
- taking and recording the reading
- removing the test material from the instrument

NOTE: - The target of the time study is the technologist working at the instrument not the instrument itself. Therefore, the time the instrument takes for analysis is not measured. The significance here is that unit values need not correlate with advertised specimen throughput capacity.

3. **Recording and Reporting** covers all that is required to convert the result into a meaningful report which leaves the laboratory:

- calculating the results
- recording the results on the patient report
- checking, sorting and filing the final report
- telephone calls associated with the report

4. **Daily or Routine Preparation** covers those preparatory steps required before a procedure can be performed which need not be repeated for each specimen being tested:

   - aliquoting reagents
   - diluting stock standards
   - instrument calibration
   - maintenance of work area

5. **Maintenance and Repairs** covers preventative maintenance done at regularly scheduled intervals as well as emergency trouble shooting and repairs performed by laboratory staff. Work done under service contracts would not be included.

6. **Solution preparation** covers the preparation of bulk reagents, solutions and quality control.

7. **Glassware Wash-up** covers all support activities related to the preparation of re-usable supplies and the disposal of specimens:

   - washing
   - drying
   - sterilization

8. **Technical Supervision** covers the technologist time required to directly supervise the procedure:

   - validation of quality control results
   - approval to report results

These examples are not meant to be a comprehensive list but merely to serve as an illustration of the types of activities incorporated in each field of study. Please note that specimen procurement is not one of the fields. This has been timed separately and assigned a unique unit value independent of subsequent testing. Activities specifically excluded from time studies are:

1. Waiting time
2. Teaching and in-service education
3. Administrative duties
4. Laboratory research and method development

NOTE: Count under the category of **Research** samples received from Research cost centres which request analysis for constituents with approved unit values.

Time studies are performed in a standard fashion by full-time staff of the Secretariat in consultation with the appropriate sub-committee. The goal of any study is to identify and measure all activities that occur as part of the procedure under normal conditions. The assignment is always to time what is being done without judgement of appropriateness or quality. An attempt is made to include a variety of hospital sizes and types in different areas of the country. At each site as many staff as possible are timed at each task and varying routines from a single stat to high volume batching are examined. Studies are then edited at the Secretariat and sent to the Statistics Canada computer which produces a composite mean time for each site. The mean of all sites becomes the suggested unit value. All the data for each line item are stored on master logs. These are regularly presented and reviewed by the sub-committees, the Workload Measurement Committee and the International Liaison group in turn.

Classes of Unit Values

1. Permanent (P)
2. Temporary (T)
3. Automated
4. Manual

Permanent values are assigned after a sufficient number of time studies has been carried out at several sites. Pending accumulation of sufficient data for a permanent value, a temporary unit value may be assigned. This will be based on a limited number of studies or extrapolated from components of previous time studies on similar procedures or instruments. Temporary values are primarily the result of instrument proliferation and are necessary when untimed procedures represent a significant portion of a laboratory's workload. Instruments should be in routine use at a site for 6 months before being time studied.

Tests which are automated will exhibit variation in time dependent upon the characteristics of the instrument. Instruments are listed separately in each section. Unless individual tests are specifically cited all work done on the instrument receives the same unit value.

Manual procedures are listed by constituent. When significant variation was observed between different methods of analyzing the same constituent, methodology has been specified, and different unit values assigned. Otherwise a single unit value represents the time for analysis regardless of methodology. (For example, glucose code 00944 applies to all manual methods for glucose).

Manual units should never be applied to automated procedures, even if a unit value for the instrument is not available. (i.e. glucose code 00944 should never be used when the method is automated or semi-automated).

IMPLEMENTATION OF THE WORKLOAD MEASUREMENT SYSTEM

Meaningful data collection is fundamentally important to the production of valid indices to monitor workload. There are four basic aspects to be considered in the set-up and operation of data collection practices. Within each of these areas many options exist and it is up to each individual laboratory to investigate and choose those alternatives which will produce the best quality data as efficiently as possible.

The four aspects are:

I. Consultation outside the department;
II. Definition of functional sections;
III. Development of simple, accurate methods for tallying procedures and activities;
IV. Capture of information in appropriate summaries.

I. Consultation outside the Department

In making any of the decisions required in implementation of a counting method, care should be taken to consult with administration. It is vital that data compiled by the laboratory be understood by those outside the department who may be responsible for transcribing summaries or interpreting comparative reports.

Laboratory data should also be able to be related to similar data reported by other departments in the hospital. External coordination will ensure that hospital information systems are consistent and feed useful data back to the laboratory. External consultation will also ensure that the requirements of provincial and federal government agencies are met.

II. Definition of Functional Sections

The effectiveness of the Workload Measurement System as an internal management tool requires the definition of functional sections. This enables the isolation and comparison of a variety of workloads within the laboratory. This will also allow the tailoring of counting procedures to specific work patterns and spread the burden of responsibility for the actual tallying. The counting of smaller workloads should improve the accuracy of the overall total.

A functional section is an area or group for which work output and manpower input can be accurately and easily identified. The nature and number of groups it is useful to define will vary with each laboratory's individual organization. Factors which should be considered include:

1. Cost centres
2. Spans of control (distribution of supervisory staff)
3. Specialized or satellite areas (e.g. Stat Lab, Toxicology)
4. Shift schedules
5. Test groupings
   - by methodology (automated, manual)
   - by clinical associaton (renal, cardiac)
6. Standard Sections in the schedule.

III. Development of Simple, Accurate Methods for Tallying Procedures and Activities

There are many details to be considered when implementing counting methods. How these are set up is vitally important and the material in this section should be carefully reviewed and thoroughly understood by all those connected with data collection.

1. Creation of a Master File

For reference purposes a list of all analyses being performed in the laboratory should be prepared. This should include unit values currently in use and the date of their assignment. It is important to keep this master list current through regular review and update. It will also be useful at this time to create a list of laboratory activities which do not generate unit values and record their frequency. You will then have a summary of all laboratory activities. An example of a master file can be found in **Appendix A** .

2. Choice of Method or Methods for Tallying Procedures and Activities

Four common methods are:

a) counting off requisitions
b) counting off master log or master worksheet
c) computer assisted
d) counting manually "as you go" at the bench

The last is the most common method used although it may be that a combination of methods is most useful. Factors which should be taken into consideration when choosing counting methods are:

i) Capture of Patient Classifications

The laboratory must determine where patient classification (inpatient, outpatient, etc.) can be identified during specimen handling. If the workbench receives samples from a central processing area labelled only with an accession number, patient classification cannot be identified at that workbench.

ii) Capture of Quality Control Standards and Repeats

When these are not included within the unit values, they should be tallied in addition to patients and given the same unit value. Blanks and duplicates performed in accordance with method directions, however, are always incorporated into the unit value and should not be tallied separately. Refer to the special directions preceding each section for specific instructions in this area and to the **Glossary** for precise definitions of these terms. The laboratory must determine where procedures must be counted in order to ensure that quality control, standards and repeats will not be missed.

iii) Item for count

Today, in many instances the number of tests performed is no longer the best parameter with which to measure fluctuating workloads. In addition, it is recognized that decreasing the number of items to be counted will reduce the opportunity for error. In this schedule of unit values a variety of items for count can be found. These have been chosen carefully to define the marginal increase in time resulting from each additional request for patient service and to simplify the process of data collection.

It is very important to be aware of and to use the correct item for count. A simple tally using the item for count will generate a "raw count" which can then simply be multiplied by the unit value to express workload. Items for count are defined in the **Glossary.** Laboratories should consider at what point in the process of handling and analysis can the designated item for count be identified.

Note: The items for count are the best building blocks for human resource Statistics. They may not provide a suitable "raw count" for other types of statistics. For example to monitor reagent costs and consumption, one must know the total number of each specific test.

iv) Profiling

a) Profiles with constant components

Protocols in some hospitals lead to consistent requests for certain procedures as a group. For the sake of convenience, this group may be requested as a profile and a single unit value can be designated to represent this specified test menu. For example, a hospital may choose a group of core liver function tests to monitor all patients with liver disease. Performance of these tests is automatic when a request for a liver profile is received. The laboratory can list this profile in its master file with a unit value based on the sum of each of the component procedures. Care must be taken to ensure that the profile value is not assigned to any component test which may be requested as an individual procedure in other clinical circumstances.

b) Profiles with variable components

Profiles may also be created from variable components if a standard pattern of practice can be established. For example:

1. In Microbiology, a composite unit value for a certain specimen type may be created by recording all the individual unit values garnered from 100 successive specimens of that type and taking the average. Such a unit value is valid as long as the patient population remains essentially the same, i.e. the percentage of positives remains constant and no changes in practice occur.

2. In Immunohematology unit values have been related to the number of procedures from a defined list that a laboratory chooses to do in certain clinical circumstances. If the practice remains constant, so do the unit values.

3. Often laboratories choose a specified set of analyses from a variable test menu available for an automated instrument. The set of test results which can be obtained may be termed a profile, although the unit value will usually be the same regardless of the constituents chosen.

Profiles created from variable components must be monitored closely for changes in practice or patient population.

Laboratories should consider when the use of profiles will reduce the complexity of counting.

v) Forms

The laboratory should consider how readily existing worksheets yield the information required. Forms must serve more needs than workload statistics alone but they should always be designed or revised with workload collection in mind. Each functional section should design and supply their own forms tailored to their specific requirements. Some standard forms are displayed in **Appendix A** and can be utilized by individual laboratories if found to be suitable.

vi) Frequency

Laboratories should consider the appropriate time interval between tallies of procedures. Information about small periods of time may provide a useful outline of work flow but may increase the amount of time and the degree of complexity involved in producing summary reports.

vii) Counting Activities Which Have No Unit Value

These fall into 2 categories:

a) Activities which are currently excluded by definition from the Workload Measurement System (ie. waiting time, teaching time, administrative time, method development time).

Keeping a count of clock hours consumed by these activities will enable a laboratory to examine the difference between total time available for work and time devoted specifically to unit producing activities. These activities must not be given unit values or "factored" into aggregate unit totals.

b) Activities which fall within the scope of the Workload Measurement System but have no unit value assigned

Uniform application of unit values is fundamental to the production of accurate comparative statistics. The practice of individual hospitals assigning unit values has been discontinued. All unit values must be assigned by the Laboratory Workload Measurement Committee. Any laboratory requiring a unit value for a procedure not listed in the current schedule must request a unit value in writing through the office of the Secretariat. Suggestions or requests to modify published unit values should also be communicated to the Secretariat.

During the interval between requesting and receiving a temporary unit value, the laboratory should keep track of the number of requests for that procedure. In this way, the procedure may be included retroactively in the annual workload statistics. New temporary unit values will be published nationally via the Newsletter.

viii) Collection of Paid & Worked Hours

This information must be known in order to generate the most common indices which are used to monitor workload over time. In many instances paid hours are made available through administration. If a laboratory relies on an external report, care must be taken to discover exactly which personnel are included in total figures. Often personnel are shared over several functional sections and their hours must be allocated proportionately when comparing indices of productivity for these sections. The laboratory must also know the breakout of regular hours, overtime hours and standby hours. These differ in the rate of pay per hour but 1 regular hour and 1 overtime hour are each 1 paid hour. Knowing precisely the components of the total paid hours figure is essential to the interpretation of workload statistics especially when they are being used for comparative purposes.

The collection of worked hours is more often the responsibility of the laboratory and requires the keeping of comprehensive attendance records. The laboratory should know not only the amount of vacation time and sick time but also educational leave, personal leave, jury duty, and any other paid time away from the laboratory.

ix) Laboratory Personnel in the Collection of Paid Hours

Much "unproductive" time has been spent in argument as to what personnel should be included in the reporting of paid hours. There is a recognition that the operation of sophisticated laboratory services requires the support of specialized personnel who either do not engage in unit producing activities or who do so for only a portion of their time. However, all staff in the laboratory budget must be counted to derive indicators such as total laboratory cost per patient day or total laboratory cost per admission, etc.

Further discussion of this aspect of workload measurement may be found in the section on Management Applications.

IV. Capture of Information in Appropriate Summaries

Laboratories should decide what information is required in summaries before selecting from the options available for tallying. As much as possible, data should be directly transferable to external forms such as the Annual Return of Health Care Facilities-Hospitals. This avoids the possibility of error when laboratory data is transposed by non laboratory personnel. Internally criteria must be selected to monitor workload over time. For a discussion of workload indicators, please see the section on applications.

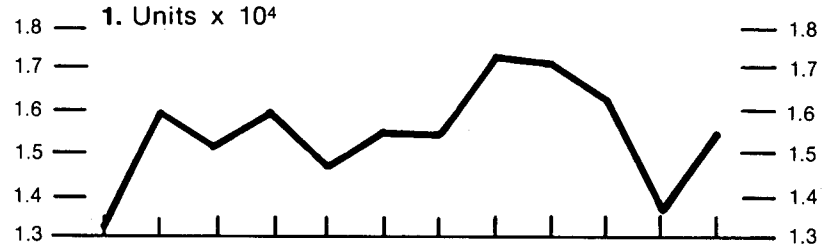
Summaries of workload data often result in huge numbers. Graphic summaries will simplify data and are a good way to monitor ongoing activities. Often they will highlight significant changes or emerging trends.

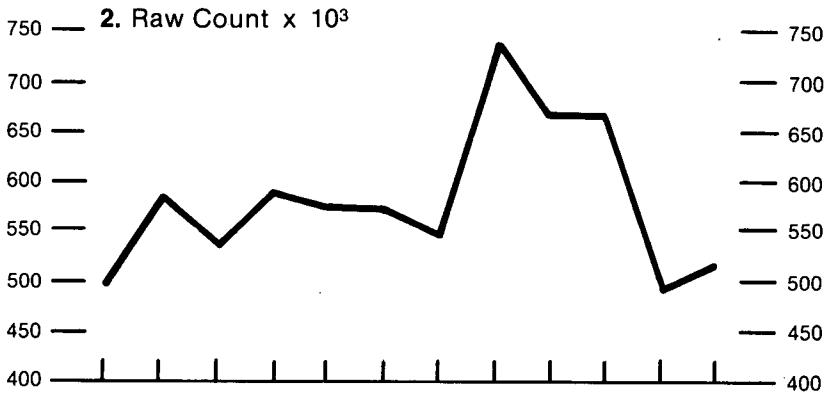
The three graphs illustrated here are reproduced from the 1984 College of American Pathologists Workload Recording Manual.

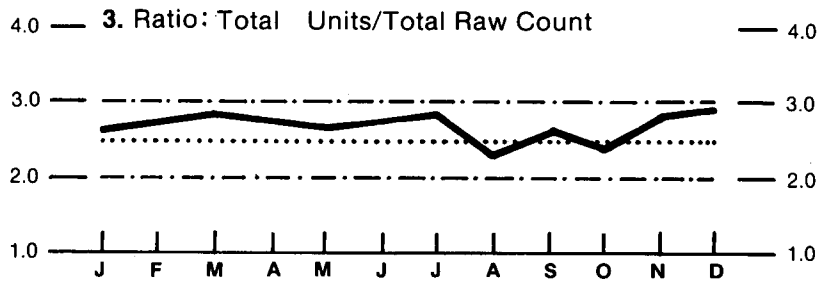
They represent:

1. Units over time
2. Raw counts over time
3. Ratio of raw counts to units.

Totals will vary from month to month but the ratio will remain constant as long as major changes do not occur in practise. This 3rd graph can be used to quality control the collection of data, since the ratio should not fluctuate beyond a narrow range. In addition, if kept for each functional section, the ratio will also yield the average unit value for that section. A comparison of the average unit values for each section will identify areas with high human resource requirements. These areas will be most sensitive to changes in workload and staffing.


1. Units x 10^4
1.8
1.7
1.6
1.5
1.4
1.3


2. Raw Count x 10^3
750
700
650
600
550
500
450
400


3. Ratio: Total Units/Total Raw Count
4.0
3.0
2.0
1.0
J F M A M J J A S O N D

MANAGEMENT APPLICATIONS OF WORKLOAD RECORDING METHODS IN LABORATORY

Data Collection

An administrative overview of the Clinical Laboratory is the "raison d'être" for workload statistics and requires the accurate collection of data related to:

1. **Workload** expressed in "Statistics Canada" Units and expressed in a raw tally of "items-for-count" according to the source of the request (sample) from:

   Patients - inpatients
   - outpatients
   - referred-in

   Quality Control - calibration standards
   - quality control
   - repeats

   Hospital - environmental control
   - staff health
   - research

2. **Hours** expressed as:

   - paid hours
   - worked hours

3. **Laboratory Personnel** included in the laboratory budget expressed in **TOTAL** and split out by:

   A) **Staffing Category**

      1. Medical staff

      2. Unit producing

         - all supervisory technologists still active at the bench
         - bench technologists
         - laboratory assistants
         - clerical staff
         - laboratory aides
         - morgue attendants (pathology assistants)

      3. Others

         - laboratory scientists
         - chief technologists
         - technical directors
         - laboratory managers
         - biomedical engineers
         - computer specialists
         - purchasing agents
         - infection control staff
         - I.V. team
         - etc.

      4. Instructors and Students

         - clinical instructors
         - student technologists
         - interns
         - residents
         - graduate students

   B) **Qualifications** (Occupational Class)

      - M.D., Ph.D., M.Sc., A.R.T., R.T., etc.

4. **Direct Expenses or Operating Expenses for**

- Personnel - Gross salaries and wages for all employees within the laboratory budget
- Supplies
- Maintenance
- Sundries
- Equipment depreciation

This data on workload, hours, personnel and costs may be collected for the Total laboratory operation or by:

- Individual Laboratory Disciplines
- Laboratory functional section or cost centre
- Specific staffing shifts
- Test priority (eg. stat, emerg.)
- Physician utilization
- Clinical service (eg. I.C.U., neo-natal)

INDICATORS

Manipulation of the data collected will provide operational indicators for internal management, budget and comparative purposes related to:

- Staffing
- Productivity
- Finance
- Workload
- Utilization

The possible permutations and combinations are immense. The detail required will depend on the site and complexity of the laboratory, the level of administration reviewing the indicators, the specificity of the review and the frequency of the review.

Indicators derived using this new schedule, which contains many procedures whose unit values have recently been revised and dramatically altered, will initially be of no use for historical comparison. They will however serve as a base line since future time studies will only reflect new procedures and those less commonly performed.

It is suggested that indicators of productivity, utilization and cost can be posted to present a visual display of administrative indicators that, in terms of management are as important as the posting of quality control charts depicting accuracy and precision of analyses.

The indicators listed below are **EXAMPLES** of what may be reported for the laboratory as a whole, or in larger laboratories what may be reported by individual section, shift, requesting service, staffing category, etc.

It is important to ensure that both the numerator and the denominator of any ratio represent the same functional section, staffing category or time period and that these remain consistent if the indicator is to be used for comparative purposes.

I. Staffing Indicators

a) number of full time equivalents (FTE) by category and/or occupational class

$$\frac{\text{total paid hours of specified group}}{\text{normal paid hours of same}}$$

b) Proportion of staff in any one category or occupational class

$$\frac{\text{paid hours of specified group}}{\text{total paid hours of department or section}} \times 100$$

c) Proportion of worked hours to total paid hours by category and/or occupational class

$$\frac{\text{worked hours of specified group}}{\text{total paid hours of same}} \times 100$$

II. Productivity Indicators

a) Total output in units related to input in paid hours of all personnel within the laboratory budget

$$\frac{\text{total units in time period}}{\text{total paid hours for same}}$$

b) Total outputs in units related to input in paid hours of specified category or occupational class

$$\frac{\text{total units in time period}}{\text{paid hours of specified group of same}}$$

c) Output in units related to input in **WORKED** hours of all personnel or any specified group

$$\frac{\text{total units in period}}{\text{worked hours for same}}$$

III. Workload Indicators

a) Output in units related to specified time period

$$\frac{\text{total units}}{\text{time period}}$$

b) Proportional distribution of units by source of request (inpatient, outpatient, quality control, etc.) for a specified time period

$$\frac{\text{units from source in time period}}{\text{total units in same}} \times 100$$

c) average unit value per item for count

$$\frac{\text{total units}}{\text{total raw counts}}$$

IV. Financial Indicators

a) Direct expenses per unit for all direct costs or any component of direct costs

$$\frac{\text{total costs}}{\text{total units}}$$

$$\frac{\text{total costs}}{\text{inpatient admissions}}$$

$$\frac{\text{personnel costs}}{\text{total units}}$$

$$\frac{\text{all direct costs excluding personnel costs}}{\text{total units}}$$

V. Utilization Indicators

a) Laboratory service (expressed in units) provided for a specified patient population

$$\frac{\text{inpatient units}}{\text{inpatient days}}$$

$$\frac{\text{inpatient units}}{\text{inpatient admissions}}$$

$$\frac{\text{total units}}{\text{clinical service}}$$

With productivity the total units per paid hour is the "bottom line". In future comparison studies, a variation in this indicator between peer group laboratories may require an explanation based on an analysis of the relationship of unit production to the paid hours of each staffing category or professional group.

With cost indices, the "bottom line" is total direct costs per unit. Variations in this indicator may require a look at the individual components of direct costs. A laboratory with a low personnel cost/unit may operate within a normal peer group range by the use of more expensive supplies with a consequently higher supply cost/unit or vice versa. The total cost per admission must be followed bearing in mind the percentage of inpatient unit production to the total workload of the laboratory. Obviously, two hospitals of equal size and inpatient load may vary tremendously in outpatient practice.

With regard to workload indicators, a variance in the total production in the period may require a breakout of this indicator's component parts. Research units in a University Hospital laboratory may skew the total, or use of quality control may vary considerably from operation to operation.

Indicators of utilization are becoming more important with the development of specialty treatment units combined with the need of administrators to understand the component requirements and cost of therapy for definable disease states.

It is likely that the use of indicators in the laboratory will become more and more necessary as the specialty becomes more complex and its costs need to be justified.

The workload system can be applied to laboratory planning, but it will require some experience with the new unit values to produce meaningful numbers.

Finally, the system and all its indicators are dependent on the accurate collection of data in the field. The section on "how to" will be modified as we gain experience.

This schedule allows no assignment of units to items-for-count that are not in the publication. In order to maintain uniformity, all temporary unit values must be obtained from the Secretariat at the Toronto Institute of Medical Technology, and they will be published regularly in the Newsletter.

SPECIMEN PROCUREMENT AND DISPATCH

The unit values in this section should be claimed only for work done by staff on the laboratory payroll.

Items for Count

The following items for count found in this section must be used when tallying workload. A full definition of terms used in this manual may be found in the glossary contained in the appendix.

1. **Patient** This term is used when the presence of the patient is necessary for the performance of the procedure.

2. **Specimen** This term is used to identify the sample or materials being collected or dispatched.

3. **Trip** This term refers to travel from the laboratory to a remote site and back (round trip).

Special Directions

1. Considerable variation exists in the circumstances associated with blood collection. Data collected reflects a wide range of complexity and the average has been used to express the central tendency of the distribution. Special situations such as collection on isolation wards or collection of specimens for blood culture were included in the time studies and have influenced the unit value for venipuncture. These have not been assigned individual unit values in order to maintain the simplest approach to data collection.

2. Code 00398 may be used when laboratory staff go to the operating room, emergency room, the bedside, etc. in connection with a procedure listed in any section of the manual. Travel time is included in unit values for all types of blood collection. Code 00398 must not be claimed in addition to codes 00212, or 00214.

3. Do not claim units for procurement unless laboratory staff are actively involved in the acquisition of the specimen. If the specimen is merely picked up and transported, claim code 00398 only.

Code Number	Procedures	Unit Value	Item for Count
00212	Venipuncture	8.0	Patient
00214	Capillary Puncture	12.0	Patient
00180	Receipt of specimens from a referring laboratory	T 6.0	Specimen
00182	Dispatch of all specimens except Microbiology organisms (includes subsequent distribution of results)	6.0	Specimen
00326	Dispatch of Microbiology organisms to other laboratories (includes subsequent distribution of results)	10.0	Specimen
00184	Handling and reporting of processed slides received from a referring laboratory for Pathologists' review	T 5.0	Specimen
00320	Procurement of any specimen for Microbiology culture or dark field microscopy	T 6.0	Patient
00398	Travel time associated with special trips outside the department of laboratories for the transport or procurement of specimens or for the performance of technical functions - see Special Direction Note 2.	8.0	Round Trip

CLINICAL CHEMISTRY

This section contains unit values for instruments grouped by mode of operation and manual procedures listed alphabetically by constituent. Unit values for manual procedures must not be applied to automated procedures even if a unit value for the instrument is not available. The unit values in this section do not include specimen procurement but do include all the categories outlined in the introduction to the manual.

Unless otherwise specified unit values:

1. apply to all specimen types (blood, urine, etc.)

2. are tallied for patients, quality control, standards and repeats

3. are **not** tallied for blanks or replicate analyses performed as part of the standard methodology

4. are tallied using one of the following "items for count"

   Specimen: This term refers to a biological sample received for analysis and is used to reflect activity leading to the production of more than one result.

   Test: This term is used to reflect activity leading to a single result.

   Antigen: This term is used for detectable characteristics which can be identified by reaction with an antibody.

   Plate: Thifp

   See **Glossary** (Appendix B) for a complete definition of terms.

Automated Chemistry

The unit value is generally characteristic of the instrumentation irrespective of the analyses being performed. However, some instrumentation eg., KDA may be used in single test mode or profile (multitest) mode and the unit values reflect the different timings in these two modes of operation. The most common instrumentation has been time-studied in routine operation. The following lists the instrumentation by group, providing for each a description, the item for count and the unit value.

I. Blood Gas Analysis

The unit values include, where required, calibration of the instrument, replicate analysis and the use of nomograms to generate additional parameters. Quality control samples should be counted as specimens.

Instrument	Unit Values Per Specimen
Blood Gas: self calibration, self calculation eg., Radiometer ABL-1, ABL-2, IL 813, Corning 168 or 175	4
Blood Gas: manual calibration, self calculation eg., Corning 165, IL 513	12
Blood Gas: manual calibration, manual calculation eg., Radiometer Astrup, BMS3/MK2; IL2 213, 313, 329, 413	20

II. Chemical Analyzers: Batch or Single Test Mode

A. Analyzers in this group have been found to operate frequently in a single test mode with equal expenditure of effort required for each analyte requested. The item for count is **"test".**

Instrument	Unit Value per Test
Seralyzer - Ames	T 3.0
Atomic Absorption eg., Ca, Cd, Li, Pb or Zn.	T 5.0
TDX - Abbott (most analyses)	T 3.0
TDX - Abbott (analysis including protein precipitation eg. digoxin)	T 4.0
Chemetrics analyzer - Worthington	T 3.0
Systems 4, 5, 102, 201, 202 - Gilford	T 4.0
Polymak II	T 4.0
Auto Analyzer - Technicon, Methodology without extraction eg., Glucose, Urea, Ca, Creatinine, Enzymes, Cholesterol, Total Protein or Urate (uric acid).	4.0
Auto Analyzer - Technicon, Methodology with extraction: eg., Cholesterol or Triglycerides.	6.0

B. Analyzers in this group operate in either of two ways: a) to analyze a specimen for a single constituent b) to analyze a specimen for several constituents. In the latter case, after the first analysis, each additional analysis requires less expenditure of effort for the complete processing of results. The item for count for these instruments is **"specimen".**

Instrument	Unit Value for Same Specimen	
	First Analysis	Each Additional Analysis
Biochromatic Analyzer 50, 100, 200, or VP - Abbott	3.5	1.0
Centrifichem - Union Carbide (Baker Diagnostics)	4.0	1.0
Cobas-Bio - Hoffman - LaRoche	T 3.5	T 1.0
Gemsaec - Electronucleonics	4.0	1.0
Gemini or Flexigem - Electronucleonics (with or without automatic loader)	T 3.5	T 1.0
Systems 203, 203-S, 3400, 3500, Impact 400 - Gilford	3.5	1.0
Multistat III - IL	T 3.5	T 1.0
KDA - American Monitor	T 2.5	T 0.6
LKB - Reaction Rate Analyzer	3.5	1.0
Rotochem - American Instrument	4.0	1.0

III. Chemical Analyzers: Profile or Multi Test Selection Mode

Analyzers in this group are capable of performing a selected series of analyses sequentially. The item for count is **"specimen".**

Instrument	Unit Value Per Specimen
Astra 4, 8 - Beckman	3.0
ACA - Dupont (Automatic Clinical Analyzer)	3.5
GSA II, G 300 - Greiner	T 3.0
Hitachi 705 - BMC	T 3.0
KDA (ATS Mode) - American Monitor	3.5
Hycel 10, 17 or HMA 16	T 5.0
Ektachem 400 - Kodak	T 3.0
Auto Analyzer - Technicon (Dual Channel)	4.0
Auto Analyzer - Technicon (Four Channel)	3.0
RA 1000 - Technicon	T 3.0
SMA 6/60 - Technicon	4.0
SMA 12/60 - Technicon	4.0
SMAC - Technicon	T 2.5

IV. Chemical Analyzers: Dedicated

Analyzers in this group are limited to performing one or more specified analyses. The item for count is **"specimen".**

Instrument	Unit Value Per Specimen
Clinitek - Ames (urinalysis)	T 3.0
Cl/CO_2 Analyzer - Beckman	2.5
E4A electrolyte analyzer - Beckman	T 3.0
Glucose and/or BUN Analyzers - Beckman	2.5
Flame Photometer (Lithium only)	7.0
Flame Photometer - Dual Channel (Na and K) eg., Beckman Klinaflame, IL 143, 343, Corning 430,	4.0
Nova 4 electrolyte analyzer	T 4.0
Nova 4 + 4 electrolyte analyzer	T 3.0
Photovolt Stat Ion (Na, K, Cl, CO_2 optional)	T 2.0
Stat Lyte (Na, K, Cl, CO_2) - Technicon	T 2.5

MANUAL PROCEDURES

Special Directions

1. **Function** or **tolerance tests** involving the sequential performance of a number of procedures may be treated as profiles and assigned a unit value based on the sum of the individual components.

   Similarly, **clearance tests** can also be assigned an aggregate unit value. However, when a calculation is required over and above that involved in determining the result of each component test, code 00791, Calculation Special should be used.

2. Code 00791 should not be used in blood gas analysis when a nomogram is used to derive additional results.

3. Urine volume measurement and calculation, code 01017, includes the measuring and aliquotting of 24 hour urines and any calculations required to express analyte concentrations in terms of 24 hour excretion.

4. The generic term Ligand or Saturation Analysis may include radioimmunassays, radiometric assays, competitive protein binding assays and enzyme immunoassays. Unit values listed for RIA represent the total time needed to perform a manual assay in duplicate.

   If non-RIA saturation analyses are performed manually, use the appropriate ^{125}I RIA value - listed below. If non-RIA saturation analyses are automated or semi-automated apply the appropriate unit value in the Automated Chemistry listings.

Ligand/Saturation Analysis (RIA)

	Procedures	Unit Value per Test
RIA group 1A	Direct assay ^{125}I. (No extraction steps with organic solvents)	7
RIA group 1B	^{125}I including extraction step(s) with organic solvent.	T 8
RIA group 1C	Direct $^{3}H/^{14}C$ assay, requiring liquid scintillation counting.	T 8
RIA group 1D	$^{3}H/^{14}C$ assay requiring liquid scintillation counting and either organic solvent extraction or several dilution steps prior to RIA	T 9
RIA group 2	Complex RIA requiring column chromatographic step between organic extraction and RIA procedure e.g. some steroid methods. Alternatively, manual enzymes incubation step precedes RIA e.g. plasma renin activity.	T 22

Unless specifically stated these unit values are generally characteristic of the constituent, irrespective of methodology. Be sure to apply the correct item-for-count.

Code Number	Procedures	Unit Value	Item for Count
00403	Acetone Qual. - Dipstick	3	Test
00404	Acetone Quant.	10	Test
00406	Acid, Free or Total - Duodenal or Gastric	3	Specimen
00922	Alanine Aminotransferase ALT (SGPT)	7	Test
00860	Albumin	12	Test
00415	Alcohol	49	Test
00413	Aldosterone - See ligand/saturation analysis		
00419	Alphafetoprotein - See ligand/saturation analysis		
00418	Amino Acids, Total - Chemical - Urine	12	Test
00420	Amino Levulinic Acid - Urine	40	Test
00422	Ammonia	39	Test
00423	Amniotic Fluid Scan	20	Test
00425	Amylase	10	Test
00427	Ascorbic Acid	25	Test
00920	Aspartate Aminotransferase AST (SGOT)	7	Test
00430	Barbiturates Qual.	32	Test
00434	Barbiturates Quant.	44	Test
00502	Bicarbonate - Titration	8	Test
00440	Bile Pigments Qual. - Urine	6	Test
00444	Bilirubin Qual. - Feces	5	Test
00446	Bilirubin Total and Direct	16	Test
00448	Bilirubin Total or Direct	11	Test
00450	Blood, Occult - Feces	6	Test
00452	Blood Qual. - Dipstick	3	Test
00456	Bromides	15	Test
00458	Bromosulphthalein	11	Test
00462	Calcium	6	Test
00464	Calcium 24 Hr. Excretion - Feces	93	Test
00470	Calcium, Sulkowitch - Urine	7	Test
00791	Calculation - Special	3	Specimen
00472	Calculus Analysis	25	Test
00503	Carbon Dioxide, Total	14	Test
00500	Carbon Monoxide	23	Test
00474	Carcinoembryonic Antigen - See ligand/saturation analysis		
00476	Carotene	8	Test
00478	Catecholamines - Urine	80	Test
	Cell Count with or without Film and Differential - CSF or other Body Fluids - See Hematology		
00486	Ceruloplasmin (Copper Oxidase)	19	Test
00488	Chlorides	6	Test
00969	Chloride Sweat Test	33	Test
00499	Cholesterol, Total - With Extraction	10	Test
00498	Cholesterol, Total - Without Extraction	7	Test
00497	Cholinesterase	30	Test
00509	Congo Red	13	Test
00511	Copper (Chemical Method)	40	Test
00514	Cortisol - See ligand/saturation analysis		
00517	Corticosterone - See ligand/saturation analysis		
00518	Creatine	26	Test
00520	Creatine Kinase (CK)	7	Test
00521	CK Isoenzyme Qual. - Electrophoresis	12	Specimen
00522	Creatinine	10	Test
00532	Cryoglobulin Qual.	9	Test
00536	Cystine (Nitroprusside) Qual.	8	Test
00539	Deoxycortisol - See ligand/saturation analysis		
00542	Digitoxin - See ligand/saturation analysis		
00545	Digoxin - See ligand/saturation analysis		
00574	Enzymes, Others	10	Test

Code Number	Procedures	Unit Value	Item for Count
00857	Estrogens, Pregnancy - Spectrophotometric - Urine	T 14	Test
00577	Estrogens, Specific (Estradiol) - See ligand/saturation analysis		
00584	Fat Qual. - Feces	6	Test
00588	Fat, Total - Feces	T 55	Test
00594	Fatty Acids Free	25	Test
00589	Ferritin - See ligand/saturation analysis		
00865	Fibrinogen - Chemical Analysis	28	Test
00866	Fibrinogen, Screening Test	6	Test
00593	Folate - See ligand/saturation analysis		
00595	Follicle Stimulating Hormone (FSH) - See ligand/saturation analysis		
00932	Fructose	14	Test
00934	Galactose Tolerance - as Glucose Tolerance		Test
00600	Gamma Glutamyl Transpeptidase	7	Test
00607	Gastrin - See ligand/saturation analysis		
00605	Gastric - Electrometric Titration	7	Test
00867	Globulin	12	Test
00944	Glucose	8	Test
	Glucose Tolerance - Unit Value is equal to the sum of units assigned to each procedure		
00942	Glucose Qual. - Dextrotest, Dextrostik, or Dipstick	3	Test
00610	Gonadotropins - see FSH and LH		
00616	Growth Hormone - See ligand/saturation analysis		
00626	Haptoglobin - Electrophoresis	26	Test
00625	Haptoglobin Qual.	15	Antigen
00624	Hemoglobin, Qual. - Spectroscopic - Urine	5	Test
00628	Hemosiderin - Urine	3	Test
00631	Homocystine Qual.	8	Test
00632	Homogentisic Acid	9	Test
00633	Hydroxybutyric Dehydrogenase	10	Test
00636	5 - Hydroxyindoleacetic Acid (5-HIAA)	22	Test
00638	5 - Hydroxyindoleacetic Acid (5-HIAA) Qual.	9	Test
00635	Hydroxyprogesterone - See ligand/saturation analysis		
00639	Immunodiffusion, first Antigen	10	Antigen
00640	Immunodiffusion, each additional Antigen	8	Antigen
00641	Immunodiffusion Qual.	10	Antigen
00642	Immunoelectrophoresis	40	Plate
00643	Immunoglobulin E, Total or Specific - See ligand/saturation analysis		
00647	Insulin - See ligand/saturation analysis		
00648	Iron, Total	10	Test
00650	Iron, Total and Binding Capacity	15	Test
00654	Isocitric Dehydrogenase	13	Test
00682	Keto Acids Qual. - Urine	3	Test
00706	Lactate Dehydrogenase (LDH)	7	Test
00710	Lactate Dehydrogenase Isoenzymes Qual. - Electrophoresis	12	Specimen
00702	Lactic Acid	27	Test
00703	Lactic and Pyruvic Acids Together	58	Test
00948	Lactose Qual. - Urine	6	Test
00720	Lead or mercury (Chemical Method)	40	Test
00722	Lecithin/Sphingomyelin Ratio	15	Test
00724	Lipase	22	Test
00726	Lipids, Total	T 10	Test
00567	Lipoprotein Electrophoresis	12	Specimen
00728	Lithium - see Chemical Analyzers Group IV		
00723	Luteinizing Hormone (LH) - See ligand/saturation analysis		
00729	Lysergic Acid Diethylamide (LSD) - See ligand/saturation analysis		
00730	Macroglobulins, SIA Test	6	Test
00732	Magnesium (Chemical Method)	13	Test

Code Number	Procedures	Unit Value	Item for Count
00735	Melanin Qual. - Urine	10	Test
00740	Methemalbumin	21	Test
00742	Methemoglobin or Sulfhemoglobin	21	Test
00747	Morphine - See ligand/saturation analysis		
00754	Mucopolysaccharides	30	Test
00756	Myoglobin - Spectrophotometric - Urine	11	Test
00766	Nitrogen, Total	12	Test
00776	Osmolality	10	Test
00798	PH Routine (see No. 01014 also) Urine	3	Test
00858	Phenolsulfonphthalein (PSP)	14	Test
00802	Phenothiazine Qual.	8	Test
00810	Phenyl Pyruvic Acid Qual.	4	Test
00804	Phenylalanine	15	Test
00806	Phenylalanine - Tyrosine Ratio	30	Test
00835	Phenylketone (PKU)	4	Test
00815	Phosphatase Acid	10	Test
00818	Phosphatase, Alkaline	7	Test
00824	Phosphate Inorganic	7	Test
00828	Phosphorus Tubular Absorption	23	Test
00832	Pigments, Abnormal - Spectroscopic	20	Test
00837	Placental Lactogen - See ligand/saturation analysis		
00840	Porphobilinogen	32	Test
00838	Porphobilinogen Qual.	9	Test
00842	Porphyrins Qual.	10	Test
00846	Porphyrins, Fractionation	67	Test
00844	Porphyrins Screening Test (Lead)	10	Test
	Potassium - see Chemical Analyzers		
00854	Pregnanediol	40	Test
00856	Pregnanetriol	40	Test
00879	Progesterone - See ligand/saturation analysis		
00881	Prolactin - See ligand/saturation analysis		
00863	Protein, Bence Jones, Qual.	18	Test
00566	Protein Electrophoresis	12	Specimen
00870	Protein 24 Hr. Urine or Fluid	6	Test
00874	Protein, Total - Chemical	8	Test
00872	Protein, Total - Refraction - Serum	6	Test
00876	Protein, Total and A/G Ratio	20	Test
00884	Quinidine	18	Test
00887	Renin - See ligand/saturation analysis		
00892	Resin Test for Achlorhydria (Tubeless Gastric Analysis)	11	Test
00902	Salicylates Qual.	5	Test
00910	Salicylates Quant.	12	Test
	Sodium - see Chemical Analyzers		
00928	Specific Gravity	4	Test
00925	Steroids Urinary	17	Test
00964	Sulfhemoglobin	21	Test
00958	Sulfonamides	27	Test
00960	Sulfonamides Crystals Qual.	2	Test
00977	T3 Resin Uptake Test - See ligand/saturation analysis		
00971	Testosterone - with Chromatography - See ligand/saturation analysis		
00970	Testosterone - See ligand/saturation analysis		
00974	Thiocyanates	15	Test
00975	Thyroid Stimulating Hormone - See ligand/saturation analysis		
00978	Thyroxine (T4) - See ligand/saturation analysis		
00984	Triglycerides	12	Test
00987	Triiodothyronine - See ligand/saturation analysis		
00990	Trypsin Qual.	11	Test
01010	Urate (Uric Acid)	8	Test
01002	Urea	7	Test
01003	Urea Qual. - Dipstick	T 3	Test
01013	Urinalysis, any single analysis, eg., Blood or Protein or Sugar	3	Test

Code Number	Procedures	Unit Value	Item for Count
01014	Urinalysis, routine (Sugar, Protein, Acetone, Specific Gravity, PH. including diagnostic Stick Tests)	4	Specimen
01016	Urinalysis, routine as above but including Microscopy	6	Test
01017	Urine Volume - Measurement and Calculation	2	Test
01020	Urobilin Qual. - Urine	3	Test
01022	Urobilinogen Qual. - Feces, Urine	10	Test
01026	Urobilinogen Quant. - Feces	35	Test
01028	Urobilinogen Semi-Quant. - Urine - 24 Hr. Excretion	12	Test
01042	Vanilmandelic Acid (VMA)	30	Test
01044	Viscosity	4	Test
01050	Vitamin B_{12} - See ligand/saturation analysis		
	Xylose Absorption - Unit Value is equal to the sum of Units assigned to each procedure		
00956	Xylose	8	Test

HEMATOLOGY

This section contains unit values for instruments grouped by mode of operation and manual procedures listed by constituent. The unit values do not include procurement but do include all the categories outlined in the introduction to the manual.

Items for Count

The following items for count are found in the Hematology section and must be used when tallying workload. A full definition of terms used in the manual may be found in the **Glossary** contained in the Appendix B.

1. **Patient** This term is used when the presence of the patient is required for the performance of the procedure.

2. **Slide** This term is used when material is placed on a slide for examination.

3. **Specimen** This term is used when a number of related procedures are performed on one sample.

4. **Test** This term is used for a defined activity leading to a single result.

Special Directions

1. **Blood Film Examination,** code 01116, includes white blood cell differential count, red blood cell morphology and platelet estimate. **Blood Film Screen,** code 01118, differs from blood film examination in that white blood cells are estimated and not counted. For any single request for a differential, claim code 01116. For any single request for red cell morphology or platelet estimation, claim code 01118.

2. When duplicates are performed as part of the standard methodology, as in coagulation tests, they have been incorporated in the unit value for the procedure and that unit value should only be claimed once.

3. Unit values are no longer to be assigned without consultation with the Secretariat. Laboratories performing **Autohemolysis Studies** (code 01110), **Circulating Anticoagulant Studies** (code 01113), or **Platelet Function Retention Tests** (code 01320) should submit a resume of their procedures to the Secretariat via the Request for Temporary Unit (see **Appendix A,** Form 6).

AUTOMATED HEMATOLOGY

Blood Cell Profiles

Instruments producing blood cell profiles have been grouped on the basis of sample introduction. Choose the description which best fits your instrument and apply the appropriate unit value.

Profile	Unit Value	Item for Count
I. Whole Blood Aspiration (Automated)		
Profile A		
- 7 parameters (Hb, Hct, RBC, WBC, MCV, MCH, MCHC)	3.0	Specimen
Profile B		
- 8 parameters (Hb, Hct, RBC, WBC, MCV, MCH, MCHC, Platelets)	3.0	Specimen
Profile C		
- 8 parameters (as for profile B) plus histograms	T 3.5	Specimen
II. Predilution of Sample Required (Semi-automated)		
Initial Dilution (regardless of number of parameters)	6.0	Specimen
Any number of additional dilutions (regardless of number of additional parameters)	2.0	Specimen
Coagulation Instruments		
Coag A Mate - PT and PTT run simultaneously	4.0	Specimen
Coag A Mate - single PT or PTT	4.0	Test

MANUAL PROCEDURES

Code Number	Procedures	Unit Value	Item for Count
	Routine Hematology		
01202	Acid Hemolysin Test - Hamm Test	18	Test
01110	Autohemolysis Studies - see special direction Note 3		
01116	Blood Film Examination (including W.B.C. Differential, WBC Differential (manual), RBC Morphology and Platelet Estimation)	11	Slide
01118	Blood Film Screen (including W.B.C. estimate, R.B.C. Morphology and Platelet Estimation)	5	Slide
01280	Bone Marrow Aspiration and Film Preparation (technical work in connection with aspiration and film preparation at the bedside, excluding staining)	36	Patient
01276	Bone Marrow Film Preparation in Laboratory	15	Patient
01278	Bone Marrow Stain Romanowsky	12	Specimen
01275	Bone Marrow - Differential	8	100 Cell
01117	Buffy Coat Preparation and Interpretation	16	Patient
01124	Cell Count with Film and Differential (CSF or other body fluids, excluding blood)	18	Test
01125	Cell Count with Cytospin, Film and Differential (CSF or other body fluid)	T 21	Test
01134	Cold Agglutinins Qualitative - see Immunohematology		
01136	Cold Agglutinins Quantitative - see Immunohematology		
01138	Cryofibrinogen	15	Test
01148	Donath - Landsteiner	23	Test
01154	Eosinophil Count Total	8	Test
01292	Eosinophil Nasal Smear	6	Slide
01157	Euglobulin Lysis Time	20	Test
01190	Folates - Microbiological Method - RIA Method - See Clinical Chemistry	45	Test
01398	Glucose 6 Phosphate Dehydrogenase (Qual.)	10	Test
01206	Heinz Bodies, Direct	15	Test
01208	Heinz Bodies Induction Test	20	Test
01210	Hematocrit, Macro or Micro	3	Test
01212	Hemoglobin	5	Test
01214	Hemoglobin Electrophoresis	25	Test
01218	Hemoglobin Fetal-Acid Elution (Kleihauer Betke)	T 8	Slide
01216	Hemoglobin Fetal (Alkali Denaturation)	31	Test
01219	Hemoglobin Fetal Qualitative (Feces)	12	Test
01220	Hemoglobin Plasma	15	Test
01221	Sucrose Lysis	T 10	Test
01102	Indices (MCV, MCH, MCHC) Manual Calculation	2	Specimen
01264	L.E. Cell Preparation and Examination	28	Test
01270	Lymph Nodes Film Preparation	33	Patient
01363	Osmotic Fragility Screen	35	Test
01364	Osmotic Fragility - Quantitative	45	Test
01274	Parasites Blood (Malarial and other parasites)	22	Specimen
01372	Reticulocyte Count	9	Specimen
01375	Reptilase Time	4	Test
01384	Sedimentation Rate (E.S.R.)	4	Specimen
01390	Sickle Cell Preparation	14	Specimen
01396	Splenic Film Preparation	33	Patient
01444	White Blood Cell Count - Manual	6	Test
	Special Stains		
01236	Iron	11	Specimen
01450	Neutrophil Alkaline Phosphate (Leukocyte)	18	Specimen
01460	Non Specific Esterase	20	Specimen
01480	Chloroacetate Esterase	T 20	Specimen

Code Number	Procedures	Unit Value	Item for Count
01465	P.A.S. (Periodic Acid Schiff)	20	Specimen
01470	Peroxidase	20	Specimen
01399	Sudan Black	20	Specimen
01475	Tartrate Resistant Phosphatase	20	Specimen
	Coagulation		
01312	Activated Partial Thromboplastin Time (Partial Thromboplastin Time) - manual or fibrometer	5	Test
01313	Antithrombin III, synthetic substrate assay (excluding Dupont ACA)	T 50	Test
01115	Bleeding Time	11	Patient
01133	Circulating Anticoagulant Studies - see Special Direction Note 3		
01146	Clot Lysis Time, dilute whole blood	10	Test
01128	Clot Retraction, qualitative	6	Test
01130	Clotting Time, whole blood	24	Patient
01157	Euglobulin Lysis Time	20	Test
01332	Factor II Assay	37	Test
01162	Factor V Assay	55	Test
01164	Factor VII Assay	55	Test
01166	Factor VIII Assay	55	Test
01168	Factor IX Assay	55	Test
01170	Factor X Assay	40	Test
01172	Factor XI Assay	60	Test
01174	Factor XII Assay	60	Test
01175	Factor XIII (Urea Solubility Method)	10	Test
01155	Fibrin Degradation Products - Ethanol Gelation Test	6	Test
01184	Fibrin Degradation Products - Latex Slide Test	8	Test
01176	Fibrinogen Screening Test (Thrombin Time)	6	Test
01330	Fibrinogen Chemical Quantitative	28	Test
01180	Fibrinolysis (plate method)	16	Test
01182	Fibrinolysis, Clot Observation	7	Test
01224	Heparin, protamine titration	50	Test
01310	Partial Thromboplastin Time with Substitution	15	Test
01318	Plasma Clotting (Recalcification) Time	8	Test
01326	Platelet Count (microscopic)	9	Test
01323	Platelet Function - Aggregation	6	Tube
01329	Platelet Function - Factor 3 (PF3)	16	Test
01320	Platelet Function Retention Tests - see Special Direction Note 3		
01334	Prothrombin Consumption	20	Test
01336	Prothrombin Time - Manual or Fibrometer	5	Test

IMMUNOHEMATOLOGY

The unit values in this section are the result of time studies conducted in 45 hospitals across Canada in 1981 and 1982.

Items for Count

The following are items for count found in this section. They are what must be used when tallying workload. A full definition of terms used in this manual may be found in the **Glossary** contained in the Appendix B.

1. **Adsorption** This term is used to represent each mixture of serum and adsorbing antigens used when separating antibody mixtures.

2. **Antigen** This term is used for detectable characteristics which can be identified by use of an antibody or lectin.

3. **Cell Reagent (cellrg.)** This term is used to count the preparation of cellular reagents.

4. **Donor** This term is used to count procedures requiring a donor.

5. **Pack** This term refers to:

   1. blood or blood products from a single donor.

   2. a vial of fractionation products.

6. **Panel Run** A panel run is counted each time a patient's serum is tested against a panel of cells. The number of cells in the panel is not a decisive factor in determining the time involved to produce a result. However, it is recognized that, in general, panels consist of 8-12 reagent cells. The same panel when run concurrently against a patient's serum in 2 or more different phases constitutes only one panel run.

7. **Slide** This term is used when material is placed on a slide for examination.

8. **Specimen** This refers to a biological sample received for analysis and reflects the performance of a number of related procedures on the one sample.

9. **Test** A test is a defined activity leading to a single result.

Special Directions for use of Immunohematology Unit Values

I. Except where specific instructions are given to count separately, controls have been considered a procedural step and are included in the unit value. For special quality control routines carried out, for example, when a new shipment of reagents is received, construct a profile and assign the appropriate unit value.

II. For transfusion reactions, construct a profile of procedures performed for each investigation and assign the appropriate unit value.

III. All functions related to Blood Bank inventory control have been incorporated in the unit value for crossmatch.

IV. Preparation of routinely used reagent cells (eg. A, B or O suspensions) has been incorporated in the unit values for profiles.

V. Code no 02524 **Blood Pack collected from Donor** may be claimed for the work associated with a rejected donor.

VI. **Blood Grouping and Antibody Detection Profiles**

In recognition of the fact that most routine Immunohematology laboratories devote a major portion of their time and effort to performing Type and Screen (Antibody detection) and Crossmatch, the Immunohematology Workload Measurement Sub-Committee aims for functional simplicity and uses a profile approach to workload recording. The profile approach, once established, will reduce the number of procedures to be counted and will have implications in pre-natal, neo-natal and pre-transfusion testing, direct antiglobulin testing and blood grouping.

Since most laboratories have slightly different techniques, a profile has to be established for each individual situation. This profile can then be used throughout the accounting year unless changes in practice occur.

Twelve separate procedures have been defined as routine and common to these profiles. Sensitized control cells and confirmatory tests which are routinely carried out with the procedure (e.g., additional anti-Rh_o(D) or forward typing) are included in the definition. The twelve procedures are as follows:

1. ABO forward (including anti-A, anti-B and anti-A,B)
2. ABO reverse (including A and B cells)
3. Rh_o(D) type (one or more reagents used)
4. Rh_o(D) control (one or more reagents used)
*5. D^u type (includes test and control)
6. Direct antiglobulin test (DAT) (polyspecific or monospecific)
7. Antibody detection (screen) - room temperature (with or without potentiating medium; with or without incubation)
8. Antibody detection (screen) - 37°C (with or without potentiating medium)
9. Antibody detection (screen) - indirect antiglobulin test (IAT) (with or without potentiating medium)
10. Auto control - Room temperature
11. Auto control - 37°C
12. Auto control - IAT

* Although this is only relevant in 15% of cases, if D^u is performed when applicable, it is counted as part of the profile.

Steps to Construct a Profile

1. From the above list, identify the procedures which are performed routinely in your blood grouping, type and screen, prenatal, neonatal and direct antiglobulin testing.

2. Total the number of procedures in each entire profile.

   Note that each phase of antibody detection only counts as one procedure even if:

   - multiple cells are used
   - multiple tubes are used

3. Choose the appropriate profile

Profile	**Unit Value**	**Code No.**
A = 10 or more procedures	16/spec.	01600
B = 7 - 9 proc.	13/spec.	01610
C = 4 - 6 proc.	9/spec.	01620
D = 3 or less proc.	7/spec.	01630

Examples of use of Profiles

1. Typical routine **type and screen testing** could involve:

   - ABO forward (anti-A, anti-B, and anti-A,B)
   - ABO reverse (A_1, A_2 and B cells)
   - Rh_o(D) type (2 different reagents)
   - Rh_o(D) control (2 different reagents)
   - D^u (when applicable)
   - Direct antiglobulin test
   - Antibody detection (screen) - room temperature, saline
   - Antibody detection (screen) - 37°C (with potentiating medium)
   - Antibody detection (screen) - indirect antiglobulin test
   - Auto control - 37°C
   - Auto control - IAT

   Number of procedures = 11; use Profile A (16 units) for each sample received

2. Typical **prenatal testing** could involve:

   - ABO forward (anti-A, anti-B, and anti-A,B)
   - ABO reverse (A_1, A_2 and B cells)
   - $Rh_o(D)$ type (2 reagents used)
   - $Rh_o(D)$ control (2 reagents used)
   - D^u type (where applicable)
   - Antibody detection (screen) - 37°C (with potentiating medium)
   - Antibody detection (screen) - IAT with 3 test cells
   - Auto control - IAT

   Number of procedures = 8; use Profile B (13 units)

3. Typical **neonatal testing** could involve:

   - ABO forward (anti-A, anti-B, and anti-A,B)
   - $Rh_o(D)$ type (2 reagents)
   - $Rh_o(D)$ control (2 reagents)
   - D^u type (when applicable)
   - Direct antiglobulin test

   Number of procedures = 5; use Profile C (9 units)

4. A) If a laboratory is requested to do a **Direct Antiglobulin Test** and polyspecific anti-globulin is used initially.

      Number of procedures = 1; use Profile D (7 units)

   B) If the polyspecific DAT is positive and the sample is subsequently tested with anti-IgG and anti-C_3d concurrently.

      Number of procedures = 2; use Profile D (7 units)

   C) If the polyspecific and monospecific DAT are performed in 2 stages then 2 X 7 = 14 units should be claimed. However, if stages A & B are performed concurrently this is a single Profile D (3/procedures) and only 7 units should be claimed.

5. When considering use of Profile D, confirmatory typing of donor packs received from the Red Cross is a special case and has been found to have a unit value of 2 per pack. Code No. 02000.

VII. Crossmatch

Units for crossmatch are counted each time a patient's serum is tested against donor cells from a pack regardless of whether a type and screen is performed prior to the crossmatch or concurrently. If confirmatory typing of the donor pack has been done upon receipt from the Red Cross, the crossmatch has a value of 5 units per pack. If confirmatory typing is done at the time of crossmatch, the value is 7 units per pack.

Example:

The laboratory quoted in Example #1 received a request to do a blood group, antibody screen and a 2 unit crossmatch. The blood groups of the donor packs selected had already been confirmed upon receipt from the Red Cross (unit value = 2 per pack and has been counted separately).

The following units were counted for this specimen:

		Code No.
Profile A	= 16	01600
Crossmatch X 2	= 10 (5 X 2)	02010
Total	= 26	

VIII. Antibody Investigation

There are various steps involved in antibody investigations. The first step usually involves the testing of one panel of cells in 2 phases **concurrently** (e.g., saline room temperature and an indirect antiglobulin at 37°C). This then constitutes one panel run. If subsequent investigations are required they may involve the use of further panels in conjunction with elution, adsorption or inhibition: with and/or without potentiating media. **Each time** the patient's serum is tested against a panel of cells in a subsequent investigation, count one panel run. For example:

Given a patient with a positive antibody screen.

a) The patient's serum is tested against a panel of 12 cells in two phases concurrently. This is one panel run, unit value = 18. Code No. 01800.

b) The results of the panel run suggest the presence of anti-E and anti-Fy^a. A second panel run is carried out to differentiate the 2 antibodies. A panel of enzyme treated cells is prepared, tested, and read after incubation at 37°C. To confirm the results these are also tested in the indirect antiglobulin phase. Unit value = 14 + 18 = 32. Code No. 01860 + 01800.

c) Fy^a phenotyping by indirect anti-globulin test was done on the patient, including positive and negative controls. Net value = 5 X 3 = 15. Code No. 01640.

d) E typing by direct agglutination was also done on the patient. Again controls were included. Unit value = 2 X 3 = 6. Code No. 01650.

Total unit value for this investigation

= 18 + 14 + 18 + 15 + 6 = 71

Code Number	Procedures	Unit Value	Item for Count
	Blood Grouping and Antibody Screen		
01600	Profile A (10-12 procedures)	16	Specimen
01610	Profile B (7-9 procedures)	13	Specimen
01620	Profile C (4-6 procedures)	9	Specimen
01630	Profile D (3 or less procedures)	7	Specimen
01640	Phenotyping by indirect antiglobulin test	T 5	Antigen
01650	Phenotyping by direct agglutination	T 2	Antigen
01670	ABO Hemolysin Test	5	Test
	Antibody Investigation		
01800	Antibody Identification - with or without potentiating medium - warm or cold - with or without neutralizing or inhibiting substance - including antiglobulin test	18	Panel run
01820	Neutralization - selected antigens	6	Antigen
01830	Antibody Titration - with or without potentiating medium - warm or cold - including antiglobulin test - count a stored parallel control separately	T 20	Antigen
01840	Preparation of eluate (heat method)	T 30	Specimen
01850	Preparation of eluate - lipid solvent	T 13	Specimen
01860	Preparation of enzyme treated cells	T 14	Panel run
	Crossmatch		
02000	Confirmatory Typing of donor pack	2	Pack
02010	Crossmatch (no donor typing)	5	Pack
02020	Crossmatch (with donor typing)	7	Pack
02030	Issue of blood, blood components or fractionation products for transfusion	2	Pack
02040	Return of blood pack to laboratory or Red Cross used or unused	1	Pack
	Miscellaneous		
02210	Preparation of sensitized cells including quality control	T 15	Cellrg.
02220	Preparation of leukocyte poor blood or Red Cell Concentrate by sedimentation	T 2	Pack
02650	Preparation by centrifugation a) leukocyte poor blood, b) Red Cell Concentrate or c) concentration of platelet concentrate	7	Pack
02230	Preparation of leukocyte poor blood by manual washings	T 10	Pack
02240	Preparation of leukocyte poor blood by IBM 2991, automated washings	T 20	Pack
02524	Blood pack collected from donor	22	Donor
02529	Cryoprecipitate, thaw & pool	3	Pack
02556	Preparation of frozen cells	6	Cellrg.
02557	Thawing of frozen cells	10	Cellrg.
02590	Lyophilized factor - reconstitution of concentrate	5	Pack
02714	Preparation of pilot tube on packs received from Red Cross	2	Pack
02715	Separation of donor pack into aliquots	15	Pack
02507	Antibody adsorption	5	Adsorp.
02657	Platelet concentrate - preparation for infusion including pooling	3	Pack
02662	Pooling of Red Cell Concentrate and Plasma	T 2	Resulting Pack
02665	Thawing of Plasma	T 2	Pack
01218	Hemoglobin Fetal-Acid Elution (Kleihauer Betke)	T 8	Slide
01221	Sucrose Lysis	T 10	Test

ANATOMIC PATHOLOGY

This section replaces the Histology section found in the 1982-83 edition. It encompasses Surgical Pathology, Autopsy Pathology, Electron Microscopy, Immunopathology, Cytopathology and Cytogenetics. All sub-sections except Autopsy Pathology have been extensively retimed and many unit values are new. New unit values are the result of time studies conducted in 64 hospitals across Canada between 1980 and 1984.

Pathology Laboratories should review all unit values and data collection forms currently in use to ensure that new values are applied correctly.

Note: Travel time associated with special trips to the operating room, emergency room the bedside etc. for the transport or procurement of specimens, or for the performance of technical functions has been assigned a unit value under Specimen Procurement and Dispatch, Code No. 00398, unit value = 8 per round trip.

Items for Count

The following items for count found in this section are what must be used when tallying workload. A full definition of terms used in the manual may be found in the **Glossary** contained in the Appendix.

1. **Antigen** This term is used when detectable characteristics are identified by reaction with an antibody.

2. **Block** This term is used when tissue or sedimented material is embedded or frozen for histologic processing.

3. **Case** This term is used to define each autopsy.

4. **Grid** This term is used in Electron Microscopy where material is placed on a grating for viewing.

5. **Membrane Filter** This term is used in cytopathology and refers to the whole filter upon which the material to be examined is retained.

6. **Print** This term refers to each copy developed from photographic film.

7. **Specimen** This term is used when an assortment of related procedures are performed on one sample. A specimen in surgical pathology is considered to be all the tissue removed at a single surgical setting. eg. hysterectomy plus appendectomy is one specimen, multiple skin lesions removed at the same time are one specimen.

Code Number	Procedures	Unit Value	Item for Count
	Surgical Pathology		
03056	Initial Handling - claim for all surgical specimens as defined in the items for count. - includes: - all clerical functions (logging-in, reporting, filing, etc) - daily and/or periodic preparation (eg. tissue processor, solutions or routine stains) - maintenance and repair (including knife sharpening)	14.0	Specimen
03058	Embedding, cutting, staining (H & E, HPS) and mounting	5.0	Block
03075	Gross: technical assistance - claim for each specimen as defined in the items for count when the unit producing staff assists the Pathologist	4.0	Specimen
03632	Decalcification - includes solution preparation	3.0	Specimen
03701	Case review - includes pulling and refiling of reports, blocks and slides and the generation of an additional report or photocopying of the old report etc., as a result of the review	T 5.0	Specimen
03781	Additional sections: cut only	2.0	Slide
03782	Additional sections: cut, stain (H & E, HPS) and mount	4.0	Slide
	Biopsies		
03785	Special Preparation of biopsy material - Use this code when, for example, a renal biopsy is divided into portions for electron microscopy and immunopathology as well as for routine examination. Do not claim this unit for the simple transfer of a portion of tissue from one fixative to another.	15.0	Specimen
	Frozen Sections		
04378	Frozen sections for rush diagnosis - includes the preparation of up to 2 blocks, the preparation of first slide from each and the staining of same. Also included is the maintenance, repair and decontamination of the Cryostat	15.0	Specimen
04375	Preparation of each additional block	6.0	Block
04376	Additional sections: cut and stain	4.0	Slide
04202	Additional sections: cut only	2.0	Slide
	Autopsy Pathology		
03308	Autopsy Pathology: Autopsy Attendant	200.0	Case
03356	Autopsy Pathology: Clerical functions	200.0	Case
03358	Autopsy Pathology: Technical function as #03058	5.0	Block

Code Number	Procedures	Unit Value	Item for Count
	Electron Microscopy		
05255	Specimen Handling: from receipt of specimen in gluteraldehyde, to end of embedding of blocks, knife making, recording and reporting and maintenance of electron microscope	60.0	Specimen
05293	Thick section: cutting, staining and mounting	10.0	Slide
05295	Thin sections: cutting, mounting, staining and checking under electron microscope, includes preparation of staining solutions	22.0	Grid
05282	Screening (scanning) and photography of grid (if performed by technologist)	20.0	Grid
08601	Develop film, enlarge and print	6.0	Print
	Immunopathology		
	The preparation of solutions and the cutting of sections, either frozen or paraffin, has been included in each specific procedure.		
05300	Initial Handling - includes all clerical functions (logging-in, reporting. etc.) and daily preparation	8.0	Specimen
05305	Immunofluorescence - Direct	T 4.0	Slide
05306	Immunofluorescence - Indirect	T 6.0	Slide
05310	Immunofluorescent analysis of serum antibodies by any kit method	T 6.0	Antigen
05311	Immunofluorescent analysis of serum antibodies by any kit method; titration of positive	T 12.0	Antigen
05320	Immunoperoxidase - direct	T 5.0	Slide
05321	Immunoperoxidase - By other methods eg. PAP, Avidin Biotin procedures	T 8.0	Slide
	Special Stains		
	Cutting, staining and mounting of sections for special stains has been included in each specific procedure.		
	Group 1	12.0	Slide
04504	Acridine orange - Fungi		
04510	Amyloid (eg., Congo Red)		
04568	Bile - Stein's or Gmelin's		
04541	Calcium (eg. Von Kossa)		
04540	Cresyl Violet		
04563	Elastic Tissue (eg., Verhoeff)		
04583	Giemsa		
04591	Hall's Stain		

Code Number	Procedures	Unit Value	Item for Count
04592	Hemosiderin (eg., Perls')		
04645	Mast Cells - Toluidine Blue		
04677	PTAH		
05005	Unna Pappenheim		
	Group 2	17.0	Slide
04503	Acid Fast - Ziehl - Neelsen		
04507	Alcian Blue		
04514	Argentaffin (eg., Fontana)		
04515	Auramine O - T.B.		
04536	Bodian (Nerve Fibers)		
04547	Connective Tissue (eg., Masson's)		
04554	D.N.A. (eg., Feulgen)		
04585	Glycogen - (P.A.S.)		
04587	Grams		
04598	Lendrum's Phloxin Tartrazine		
04915	Lipofuscin (eg., Schmorl's)		
04637	Luxal Fast Blue - Neuropath. Modification		
04641	Mann's Stain		
04643	Masson Trichrome		
04646	Mayer's Mucicarmine		
04922	Melanin (eg., Fontana)		
04926	Mucin (P.A.S.)		
04927	Myelin (eg., Luxal Fast Blue)		
04942	Oil Red O (Simple Fat)		
04678	PTAH - Neuropath. Modification		
04701	Saffron (Hematoxylin Phloxine Saffron)		
	Group 3	23.0	Slide
04508	Alcoholic Hyaline		
04509	Amido Black - Hemoglobin		
04537	Bowies, J.G.		
04566	Enzymes (eg., Gomori, D.O.P.A., Dehydrogenases)		
04850	Fat (Neutral Fat) - Does Not Include F.S. (eg., Nile blue SO4)		
04852	Fatty Acids (eg., Fischler)		
04578	Fungus (Methenamine Silver)		
04577	Fungus (P.A.S. Counterstain) Gridley's		
04928	Myelin (Heidenhain)		
04665	Orcein Giemsa		
04972	Reticulum (eg., G and S)		
04695	Romanes		
	Group 4	30.0	Slide
04584	Glees and Marsland		
04596	Holmes		
04597	Holzer		
	Group 5	50.0	Slide
04929	Myelin (Marchi's Technique)		
	Group 6	100.0	Slide
04546	Cone and Penfield		
04534	Bielschowsky		

CYTOPATHOLOGY

Special Directions for use of Cytology Unit Values

1. In order to maintain the simplest approach to unit collection, code number 04090 should be used for specimens prepared by Cytospin technique. Although this procedure is more time consuming than conventional centrifugation, this extra time is offset by a shorter screening time per slide. Therefore appropriate compensation for Cytospin specimens is achieved through use of code 04090 + code 04084.

2. Code number 04090 includes:

    1. The preparation of smears

    2. The preparation of a cell block up to the point that the material is passed to Histology for processing, staining and mounting. If any of these latter functions are performed in Cytology, then surgical Pathology code 03058 should be claimed. Double counting of these activities in Histology and Cytology should be avoided.

Code Number	Procedures	Unit Value	Item for Count
	Gynecological		
03928	Initial identification, clerical functions, staining (including daily preparation) reporting, slide filing and follow-up	10	Specimen
04083	Screening (technical)	5	Slide
04091	Cytohormonal evaluation expressed as a quantitative index after counting an adequate number of cells when it is requested by a physician	10	Specimen
	Non-gynecological		
03930	Initial identification, clerical functions, staining (including daily preparation) reporting, slide filing and follow-up	10	Specimen
04084	Screening (technical)	5	Slide
04089	Preparation of fluids by membrane filter technique	T 8	Membrane Filter
04090	Preparation of fluids by centrifugation for smears and/or cell block (see Special Direction Note 2)	T 7	Specimen
04096	Preparation of sputa by pick and smear technique	T 6	Specimen
04093	Preparation of smears from fine needle aspiration	T 10	Specimen

CYTOGENETICS

Special Directions for use of Cytogenetics Unit Values

1. Considerable variation exists in the types of cases encountered in Cytogenetics. Data collected reflects a wide range of complexity and the average has been used to express the central tendency of the distribution.

   A profile has been developed to illustrate the statistical average expressed by the 4 basic unit values This profile is listed as a guideline for application of additional units and is not intended to recommend or suggest a standard of practice.

   Profile of the Statistical Average

   - up to 25 metaphase cells are examined
   - only one banding procedure is used
   - up to 10 photographs are taken and all chromosomes identified on each photograph
   - up to 3 karyotypes are prepared
   - cell culture photography and cell analysis are performed in the laboratory
   - all technical procedures are performed manually

   Laboratories in which a high percentage of the workload deviates significantly from this profile may consult with the Cytogenetic sub-committee through the office of the Secretariat.

2. These unit values are not intended to address special culture procedures such as extended chromosome studies, breakage studies, or fragile X studies. These are high priority procedures for future studies by the sub-committee.

3. In recognition of the effort associated with a failed culture, these specimens should be assigned the same basic unit value as a successful culture.

Examples of Use of Cytogenetic Unit Values

I. Having examined 25 cells from a blood culture stained by the GTG method an additional 25 GTG stained cells must be analysed to rule out mosaicism.

Units Claimed:	315	Code 04110
	56	Code 04140
TOTAL	371	

If a further 10 cells are analysed code 04140 may be claimed again for a total of 427 units.

II. After 25 amniotic fluid cells stained by RFA have been studied, it is necessary to C stain and analyse 10 additional cells.

Units Claimed:	465	Code 04100
	285	Code 04105
TOTAL	750	

III. Initially 25 QFQ stained bone marrow cells are studied. Subsequently an additional 25 cells are examined and a decision made to stain for NOR. Eight cells stained by NOR are analysed.

Units Claimed:	760	Code 04120
	56	Code 04140
	326	Code 04125
TOTAL	1,142	

Code Number	Procedures	Unit Value	Item for Count
04100	Chromosome Karyotype: **Amniotic Fluid**	465.0	Specimen
04105	Additional special staining and banding procedure from the same culture, including analysis and karyotyping as required. **Amniotic Fluid**	T 285.0	Specimen
04110	Chromosome Karyotype: **Peripheral Blood** (mitogenic stimulation)	315.0	Specimen
04115	Additional special staining and banding procedure from the same culture, including analysis and karyotyping as required. **Peripheral Blood** (mitogenic stimulation)	T 206.0	Specimen
04120	Chromosome Karyotype: **Bone Marrow or Peripheral Blood** (no mitogenic stimulation) for leukemia studies	T 760.0	Specimen
04125	Additional special staining and banding procedure from the same culture, including analysis and karyotyping as required. **Bone Marrow or Peripheral Blood** (no mitogenic stimulation) for leukemia studies	T 326.0	Specimen
04130	Chromosome Karyotype: **Tissue** (eg. skin, products of conception, etc.) requiring long term culture	T 390.0	Specimen
04135	Additional special staining and banding procedure from the same culture, including analysis and karyotyping as required. **Tissue** (eg. skin, products of conception) requiring long term culture	T 261.0	Specimen
04140	Counting of up to 25 additional cells from the same culture and using the routine staining procedure. **All specimen types**	T 56.0	Specimen
04145	Each additional karyotype in excess of 3 done on the same banding procedure. **All specimen types**	T 23.0	Karyotype
04099	Sex Chromatin Identification (either X chromatin or Y chromatin)	16.0	Specimen

MICROBIOLOGY

This section contains new units in the sub-section of Bacteriology which are based on extensive time studies done across Canada in 1983. Revisions to the sub-sections of Parasitology, Mycology, Mycobacteriology and Serology are planned for inclusion in the next edition of the schedule (1986-87).

Special Directions

1. The initial handling unit value #08822 comprises the activities common to all specimens sent to the Microbiology laboratory. This includes all clerical functions; (eg. entering, reporting, telephone and dispatch of results); daily or periodic preparation, maintenance (eg. checking temperature of incubators); autoclaving discards and organization of supplies and media.

   In addition this value reflects activities specific to certain specimen types i.e. planting and incubation for Bacteriology and Mycology specimens, centrifugation for Serology specimens, a visual examination and description for Parasitology specimens OR special handling for Mycobacteriology specimens.

2. The media unit value #08825 reflects the preparation of **all** media, from simple procedures to more complex preparations (eg. antibiotic plates), and is counted per plate, bottle or tube.

3. According to surveys, Blood cultures generally are held from 7 to 21 days and examined daily. All readings or visual inspections are included in the unit value. However routine sub cultures and smears are not included in the unit value and must be counted separately.

4. All commercial kits and semi-automated or automated systems have been grouped under the heading "Systems". The unit value includes all steps in a procedure from picking the colony to the first recording of the result. Any maintenance and repair or daily preparation on an automated machine has been included in the unit value:

   For example - the API 20E strip, #09001 would include the inoculation of the broth or saline, standardization, inoculation of the strip and purity plate, incubation, adding reagents, oxidase test, reading the strip and purity plate and recording the result.

5. The application of discs #08922 does not apply to the Kirby Bauer susceptibility testing which has a separate unit value.

6. The Kirby Bauer procedure #09121 includes all steps from the inoculation of the broth to the recording of the results. Quality Control organisms are not included, and should be counted separately, per organism.

7. The replicator method #09032 is calculated in the following manner:

   1 unit per organism
   1 unit per plate

   eg. If 1 organism has 12 antibiotic plates and 5 I.D. plates the unit value becomes

1	+	17	= 18 units
organism		plates	

   If, however, the same 17 plates are inoculated with 30 organisms the unit value becomes:

30	+	17	= 47 units

8. If, in Parasitology, a smear is made from a stool concentrate and read, claim 7.0 units (#09205) per smear.

9. Quality Control units should be counted for each procedure, where applicable.

10. **Items for count**

Antigen Refers to detectable characteristics which can be identified by reaction with an antibody.

Injection Refers to one entry of an extract into the portal of an instrument.

Jar Refers to any jar set up to produce non aerobic atmospheric conditions.

Organism Refers to a pure isolate.

PBT Is used as an item for count when counting plates, bottles or tubes (PBT).

Reading Applies to original culture plates or tubes. These units are calculated per specimen and **NOT** per piece of medium. All other procedures in Bacteriology include a reading value and should not have this value added. If a specimen is read at 24, 48 and 72 hours claim 3 x 1 units.

Smear Refers to material placed on a slide. There may be more than one smear per slide.

Specimen Is a biological sample for analysis.

Code Number	Procedures	Unit Value	Item for Count
08822	**Initial Handling:** includes handling of **all** specimens from receipt of specimens to end of planting, all daily preparation, telephone calls, general maintenance and recording and reporting	8.0	Specimen
08825	**Media Preparation**	0.6	PBT
	Microscopy: includes smear, prep, stain and examination		
08840	Gram stain - direct from smear	T 4.0	Smear
08842	Gram stain - for morphology	2.5	Smear
08844	Gram stain - blood cultures	3.0	Smear
08848	Wet Prep - eg. for Trichomonas, India Ink or motility	1.5	Smear
08850	Ziehl-Neelsen - direct from specimen	20.0	Smear
08854	Ziehl-Neelsen - confirmatory from culture	5.0	Smear
08856	Acridine Orange	2.0	Smear
08860	F.A. from isolate	4.0	Organism
08862	Fluorescent stain for Mycobacteria	5.0	Smear
08864	Simple stains eg. Methylene Blue Neisser	4.0	Smear
08866	Complex stains eg. Giemsa or PAS	10.0	Smear
08868	KOH or LPCB - Direct Smear Mycology	3.0	Smear
08846	Spore stain	8.0	Smear
08852	Darkfield	10.0	Smear
08873	Trichrome Stain & Read	T 8.0	Smear
08870	Iron Hematoxylin Stain & Read	T 14.0	Smear
	Preparation of Specimen for culture		
08883	Tissue grinding	5.0	Specimen
08889	Liquifaction of Sputum (excluding processing for mycobacteriology)	3.0	Specimen
08890	Serial dilution for Culture	1.0	Per Dilution
08915	Miles and Misra Count, including inoculation and reading; excluding preliminary dilution (see #08890)	7.0	PBT x 6
	Bacteriology		
08905	Read culture - original culture plates (aerobic or anaerobic)	1.0	Reading
08908	Subculture and reading	1.5	PBT
08910	Set up and open anaerobic jars - any system	3.0	Jar
08914	Rapid tests includes reading eg. oxidase, catalase, bile solubility, slide coagulase, etc.	1.0	Organism
08916	Biochemical - conventional tube methods, includes reading eg. coagulase, TS1, etc.	1.5	PBT
08917	Biochemical - plate method, includes reading - eg. DNase	1.5	PBT
08920	Disks - single disk for identification, includes reading - eg. Bacitracin, optochin, novobiocin	1.5	Organism
08922	Disks - disk more than two for identification includes reading, e.g. X/V factor (not Kirby Bauer)	2.0	Organism
08940	Animal Inoculation for any purpose; including autopsy and collection of material for smears and culture	100.0	Animal

Code Number	Procedures	Unit Value	Item for Count
	Blood Cultures		
	Includes all readings (aerobic and anaerobic) of the original culture bottles. Does not include Gram smears, or subcultures.		
08930	Manual Blood Cultures	6.0	PBT
08932	Bactec 460	5.0	PBT
08935	Bactec 460/461 with data logger	T 6.5	PBT
08938	Dupont Isolator	T 9.0	PBT
	SYSTEMS: all units include innoculation and reading of purity plates where it is part of the procedure.		
09001	API 20A	8.0	Organism
09002	API 20E	T 6.0	Organism
09003	API 10S	T 4.5	Organism
09004	API 20S	T 6.0	Organism
09010	API Neident	T 5.0	Organism
09011	API Staphident	T 5.0	Organism
09014	DMS rapIDe	T 6.0	Organism
09016	Enterotube/Oxiferm	3.0	Organism
09020	Micro ID - 4 hour ID Enterobacteriaceae	5.0	Organism
09022	Minitek - anaerobes	9.0	Organism
09026	Minitek - non fermenters	T 8.5	Organism
09028	Unitek N/F	T 8.0	Organism
09032	Replicator: 1 unit per organism plus 1 unit x # plates used		Organism/ Plate
09044	Autoscan with Data Management System	T 13.0	Organism
09046	Autoscan without Data Management System	T 6.5	Organism
09050	Microscan or Micromedia - Manual Reader	T 6.0	Organism
09054	Microscan - combo	T 7.0	Organism
09058	Ms_2/Avantage ID	T 5.0	Organism
09060	Ms_2/Avantage urine screen	T 2.0	Organism
09063	Ms_2/Avantage susceptibility	T 5.0	Organism
09066	Sceptor	T 7.0	Organism
09069	Sensititre	T 9.0	Organism
09070	Vitek urine screen	T 4.5	Organism
09072	Vitek others	T 4.0	Organism
09076	Autobac	7.0	Organism
09079	Micromedia - semi auto MIC with frozen plates	T 6.0	Organism
	Additional Identification Procedures		
09101	Streptex six antigens	4.0	Organism
09102	Lancefield grouping	7.0	Organism
09250	Slide Agglutination of any kind - latex - rbc - co-agglutination - bacteria - pregnancy - heterophile	1.0	Antibody-Antigen Reaction
09106	Beta Lactamase	T 1.5	Organism
09107	Phadebact	3.0	Organism
09119	Gas Liquid Chromatography includes preparing the initial extract(s) and first injection	T 16.0	Organism
09120	Gas Liquid Chromatography - each repeat injection	7.0	Organism
	Susceptibility Testing		
09121	Kirby Bauer	5.0	Organism
09122	Broth Disk method for Anaerobes	T 1.5	PBT

Code Number	Procedures	Unit Value	Item for Count
09032	Replicator: 1 unit per organism plus 1 unit x # plates used		Organism/ Plate
09123	Antibiotic testing by manual method for 1 organism including controls	75.0	Antibiotic
09124	MIC/MBC preparation per antibiotic series	20.0	Antibiotic
09126	Bioassay	45.0	PBT
09153	Serum Bacteriocidal level	20.0	Specimen
	Mycology		
08822	Initial Handling	8.0	Specimen
09128	Examination of Hair by Ultra Violet Light	3.0	Specimen
08868	KOH or LPCB - Direct Smear Mycology	3.0	Smear
09181	Tease Mount	5.0	Smear
09184	Slide Culture	15.0	Culture
09192	Germ tube	T 2.0	PBT
09193	Chlamydospore Production	T 3.0	PBT
09191	Sugar Assimilation	T 7.0	Test
09178	Each reading of cultures	1.0	PBT
09180	API 20C	T 6.0	Organism
	Mycobacteriology		
08822	Initial Handling	8.0	Specimen
08950	Ziehl-Neelsen on primary specimen	20.0	Smear
08854	Ziehl-Neelsen, confirmatory from culture	5.0	Smear
08944	Fluorescent Stain (Auramine Rhodamine)	5.0	Smear
08953	Digestion of Sputa, etc.	T 3.0	Specimen
08956	Inoculation	1.0	PBT
09178	Each reading of cultures	1.0	PBT
08960	Bactec for Id	T 13.0	PBT
08965	Niacin	5.0	Organism
08968	Arylsulphatase	2.0	Organism
08971	Catalase	2.0	Organism
08977	Antibiotic Susceptibility Preparation	15.0	Organism
08978	Antibiotic Susceptibility Reading plus control	3.0	Organism
	Parasitology		
08822	Initial Handling	8.0	Specimen
09205	Direct Smear - preparation and reading	T 7.0	Smear
09208	Formal Ether Concentrate, includes preparation of smears	T 4.0	Specimen
08873	Trichrome Stain & Read	T 8.0	Smear
08870	Iron Hematoxylin Stain & Read	T 14.0	Smear
08872	Wet Prep for Trichomonas	T 2.0	Smear
09211	Pinworm or scotch tape preparation	7.0	Smear
09212	Identification of worm or arthropods	10.0	Specimen
	Serology		
08823	Initial Handling: includes all handling of specimen from receipt to the end of separation of serum from red cells	T 5.0	Specimen
09088	Tube Agglutination including control and preparation of suspension	20.0	Organism
09091	Quellung Reaction including control	5.0	Organism
09093	Plate toxin-antitoxin reaction eg. Nagler or Elek plate	9.0	Organism
09118	Phase Conversion by Craigie tube	4.0	Organism

Code Number	Procedures	Unit Value	Item for Count
09325	Latex for rheumatoid factor quantitative	20.0	Specimen
09335	Paul Bunnell Test (sheep or horse red cells and absorption by Guinea pig kidney or ox cells)	25.0	Specimen
09261	C reactive protein by capillary tube method	2.0	Specimen
09243	Prep of cardiolipin antigen VDRL	5.0	Prep
09264	VDRL, VDRL Quantitative	20.0	Specimen
09363	Fluorescent Treponemal Antibody (including controls single serum)	85.0	Serum
09366	Fluorescent Treponemal Antibody (including controls each additional serum)	30.0	Serum
09250	Slide agglutination of any kind - latex - rbc - co-agglutination - bacteria - pregnancy - heterophile	1.0	Antibody-Antigen Reaction
09254	Pregnancy Test - tube agglutination	2.0	Tube
09271	Agglutination test single antigen (Enteric, Brucella, Weil-Felix test, P. Tularensis)	20.0	Organism
09273	As above each additional antigen	5.0	Antigen
09274	Enteric Agglutination Test (Widal) VI agglutination test inc. titration of standard serum	25.0	Organism
09281	Brucella Agglutination test if performed simultaneously with enteric agglutination test	5.0	Antigen
09284	Coombs test for detection of Brucella agglutinins	20.0	Organism
09319	Leptospiral Agglutination test 4-6 serum dilutions - single antigen	30.0	Organism
09322	As above each additional antigen	10.0	Addn Antigen
09341	Antistreptolysin O estimation, tube dilutions	30.0	Specimen
09344	Antistreptolysin O estimation - Micro-technique - 18 dilutions	40.0	Specimen
09356	Preparation of cells for Complement Fixation tests	15.0	Prep
09357	Hemolysin/Complement checkerboard	85.0	Test
09358	Complement Fixation Test - single antigen	20.0	Organism
09359	As above each additional antigen	9.0	Antigen
	Environmental Bacteriology		
09416	Test of Sterilization eg. autoclaves	4.0	Test
09430	Culture of material on membrane filter	10.0	Filter
09433	Colony count on membrane filter	3.0	Filter
09437	Air sampling - settle plate (exposure and colony count)	5.0	PBT
09440	Air sampling by slit samplers (exposure and colony count)	8.0	PBT
09443	Air sampling by Impinger - including subculture of sampling fluid and colony count, single plate	10.0	PBT
09445	As above each additional plate	4.0	Addn Plate
	Virology		
09551	Isolation of virus by tissue culture	35.0	Tissue
09554	Isolation of virus in eggs	30.0	Tissue
09570	Hemagglutination - inhibition test	30.0	Tissue
09573	Hemadsorption - inhibition test	30.0	Tissue
09576	Neutralization test Animal Inoculaton see #08940	40.0	Tissue

Code Number	Procedures	Unit Value	Item for Count
09589	Hepatitis Associated Antigen - See Manual Chemistry Ligand/ Saturation Analysis		
	Investigation on Mycoplasma		
09511	Primary isolation of mycoplasma	4.0	Solid Media
09514	Primary isolation of mycoplasma	4.0	Diphasic Media
09517	Subculture on solid or diphasic media	20.0	PBT
09520	Dienes Stain for mycoplasma colonies	3.0	Smear
09523	Metabolic Tests in diphasic media	4.0	Test
09526	Methylene Blue plating test	10.0	Test
09529	Hemolysis test for Mycoplasma pneumoniae	10.0	Test
09531	Hemadsorption Test	15.0	Test
09534	Growth Inhibition test	10.0	Test
09537	Estimation of colony forming units	30.0	Single Reading
09539	Estimation of colony forming units	10.0	Ea. Addn Reading
09542	Coverslip prep for mycoplasma	10.0	Prep

MISCELLANEOUS PROCEDURES

Code Number	Procedures	Unit Value /Patient
08495	EEG (Technical and Clerical)	120
08501	Histocompatability - Tissue Cross Match (Only)	150
08502	Histocompatability - Tissue Typing (Only)	210
08503	Histocompatability - Tissue Cross Match and Typing Performed on a Patient at the Same Time	250
05463	ECG (Technical and Clerical)	26
05482	ECG Fetal	30
08680	Semen Analysis for the Presence of Sperm Only	5
08681	Semen Analysis Inc. Count, Motility and Morphology	15

Cardiorespiratory Procedures

Cardiorespiratory Procedures have been removed from the Schedule of Laboratory unit values. They have been extensively retimed and unit values for them may be found in a separate schedule entitled Respiratory Technology/Pulmonary Function, available from:

Workload Measurement
Institutional Statistics Section
Health Division
Ottawa, Ontario
K1A 0T6

Nuclear Medicine

In vivo Nuclear Medicine procedures are currently under investigation. When time studies are completed, a separate schedule of unit values will be published for Nuclear Medicine. Unit values for in vitro Radioimmunoassays are listed in the Clinical Chemistry section of this manual. Hospitals reporting in vivo unit values may continue to use those listed in the 1982-83 edition of the Laboratory Schedule.

APPENDIX A

Forms

1. Data Recording
2. Functional Section Workload Summary
3. Total Laboratory Workload Summary
4. Collection and allocation of paid and worked hours
5. Master Procedure and Activity file
6. Request for Temporary Unit Values

Forms 1 - 5 are samples of how workload data may be collected. They may be utilized by individual laboratories if found to be suitable.

Form number 6 may be photocopied when a request for a temporary unit is submitted to the Secretariat. If the form does not suit the particular procedure a free form description should be submitted which includes the elements outlined in Form 6.

FORM 1

DATE _____

DATA RECORDING

Laboratory Section _____ Instrument _____

Total Specimens _____ Total Tests _____ Total Workload Units _____

No.	Specimen Name	Classification									Tests Performed																
		Patients		Ref. In	Qual. Cont.	Cal. Std.	Envir.	Staff Health	Re-search	Re-peats	GLUC	UREA	Na	K	C1	CO_2	AST	CREAT	BILIR	ALK PHOS	LDH	ALT	CK	TOT PROT	URATE	TRI-GLY	Ca
		In	Out																								
1																											
2																											
3																											
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30																											
	Total																										

Simplify forms by including only the columns required for specimen classification and the tests performed by the instrument.

a) Total Specimens _____ b) Unit Value per Specimen _____ c) Total Units [a x b] _____

Total Tests _____

FORM 2

FUNCTIONAL SECTION
WORKLOAD SUMMARY

SECTION: **HEMATOLOGY**

SUB-SECTION _____ MONTH _____

Code No.	Procedure	Unit Value	In-patients		Out-patients		Referred-In		Quality Controls		Standards		Repeats		Environ-mental		Staff Health		Research		Total	
			Raw Count	Units	Raw Count	Units	Raw Count	Units	Raw Count	Units	Raw Count	Units	Raw Count	Units	Raw Count	Units	Raw Count	Units	Raw Count	Units	Raw Count	Units
01116	Blood Film Examination	11	1,703	18,733	965	10,615	109	1,199	60	660							4	44			2,841	31,251
01384	Sedimentation Rate (E.S.R.)	4	127	508	167	668	66	264	9	36							1	4	6	24	376	1,504
01336	Prothrombin Time	5	87	435	19	95	16	80	34	170							3	15			159	795
01326	Platelet Count (Microscopic)	9	473	4,257	174	1,566	8	72	45	405									7	63	707	6,363
01312	Activated Partial Thromboplastin	5	86	430	22	110	17	85	45	225							3	15			173	865
01372	Reticulocyte Count	9	109		53		10		11										1		184	
01115	Bleeding Time	11	7	77	8	88															15	165

FORM 3

TOTAL LABORATORY WORKLOAD SUMMARY

Date _____

Raw Counts and Standard Units Done by Hospital Laboratories during the Year	Inpatients		Outpatients		Referred-In		Quality Controls, Calibration Standards and Repeats		Environmental, Staff Health and Research		Total Accumulated Hours	
	Raw Count	Units	Raw Count	Units	Raw Count	Units	Raw Count	Units	Raw Count	Units	Paid	Worked
01 Specimen Procurement and Dispatch												
02 Clinical Chemistry												
03 Hematology												
04 Immunohematology (Blood Bank)												
05 Surgical Pathology												
06 Autopsy Pathology												
07 Cytology												
08 Cardio-Respiratory												
09 Nuclear Medicine												
10 Microbiology												
11 Miscellaneous												
12 Other (Please specify)												
13 TOTAL												

FORM 4

COLLECTION AND ALLOCATION OF PAID AND WORKED HOURS

Name: _____ Month: _____

Record the time worked each day to the nearest $\frac{1}{4}$ hour, excluding lunch and coffee-break time.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
7	7			Vacation							7	7	7	7	7		

19	20	21	22	23	24	25	26	27	28	29	30	31	Hours Worked 112 / Hours paid 176
7	7	7	7	7			Sick	7	7	7	7		

Estimate the time (as %) worked in the various departments.

Clinical Chemistry	Hematology	Blood Bank	Surgical Pathology	Autopsy Pathology	Cytology	Nuclear Medicine	Micro-biology	Specimen Procure-ment	Other
25	50	25							
Hours worked and paid									
28 / 44	56 / 88	28 / 44							

FORM 5

HEMATOLOGY LABORATORY

MASTER PROCEDURE AND ACTIVITY FILE

Revised: (i) 1983, August
(ii) 1984, July
(iii) 1985, March
(iv)
(v)

Functional Sections:
1) Routine (R)
2) Coagulation (C)
3) Special (S)

Unit Producing

Procedure	Method	Funct. Section	Code	Unit Value & Item for Count		
				1978	1982	1985
Blood film exam.	manual	R	01116	11 slide	11 slide	11 slide
PT, PTT Profile	coagamate 2 channel	C	01530	10 spec	4 spec	4 spec
Platelet Count	manual	R	01326	14 test	9 test	9 test
Sed. Rate	manual	R	01384	5 test	4 test	4 test
CBC Profile Hgb, HCT, RBC, WBC, indices and platelets	Coulter S plus	R	01520	---	3 spec	3 spec
Hgb elec.	Beckman	S	01214	46 test	25 test	25 test

Non Unit Producing

Activity	Who	Frequency	Duration	Date Started	Date Stopped
Prep shift schedule	chief tech	every 3 months	5 hours	1981-01-12	
Student lectures	clinical instructor	weekly	1 hour	1981-09-07	
In-service	2.0 FTE & clinical instructor	bi-weekly	1 hour	1982-03-15	
Hematology meeting	8.0 FTE	monthly	1 hour	1983-02-13	
TOA 120 Instrument evaluation	1.0 FTE	daily	2 hours	1984-04-16	1984-04-20

FORM 6

CANADIAN LABORATORY WORKLOAD MEASUREMENT SYSTEM
REQUEST FOR TEMPORARY UNIT VALUE

Name of procedure or instrument: _____

Secretariat Use Only

Hospital:	Hospital Code:
Address:	Date Rec'd:
	Referred to:
Requested By:	Date Ret'd:
Department:	
Telephone:	
	Unit Value Assigned:
	Item for Count:

For each procedure or instrument requiring a temporary unit value, supply the following information where relevant:

1. Manufacturer: _____
2. Model: _____
3. Features: (eg. manual or automatic loading)

   _____

   _____
4. Test menu: _____
5. Brief description of methodology:

   _____

   _____

   _____

   _____

6. Type of specimen analyzed: _____

_____

7. Major steps in initial handling of specimen:*

   1. _____
   2. _____
   3. _____
   4. _____
   5. _____

8. Major steps in specimen testing* (include instrument set-up):

   1. _____
   2. _____
   3. _____
   4. _____
   5. _____
   6. _____
   7. _____
   8. _____

9. Major steps in recording and reporting:*

   1. _____
   2. _____
   3. _____
   4. _____
   5. _____

10. Are reagents bought or prepared in house? _____

_____

11. What preventative maintenance is required?

Procedure	Frequency	Estimated Time Involved

12. What is the average workload per month?

Patients: _____ Quality Control: _____

Standards: _____

*For a description of the types of activities in these categories, see the introductory section of the Schedule of Unit Values for Clinical Laboratory Procedures.

APPENDIX B

Glossary of Terms

Allocation — The process of distributing hours and/or workload units in order to ensure that they are credited to the appropriate functional section or cost centre.

Calibration Standards — Pure solutions or reference samples run for the purpose of establishing the calibration curves required to determine the value of the unknowns. When counted separately, calibration standards receive the same unit values as unknowns.

Employee Health — A source of request for laboratory service emanating from the Employee Health Program. Employees and students receiving laboratory service not related to this program are classified as patients of the hospital.

Environmental Control — A source of request for laboratory service encompassing procedures such as a bacteria count on linen samples.

Full-Time Equivalent — This represents the standard number of paid hours for one employee under the terms and conditions of employment in any given institution.

Functional Section — A section organized and/or operating within the department of laboratories for which work output and manpower input have been isolated.

Hours, Normal Paid — The paid hours of a full-time equivalent for a defined period of time. Normal hours may vary for different occupational groups or with collective agreements. They are usually expressed per annum or per week.

Hours, Total Paid — All paid time including vacation time, sick time and any other paid time off. Total paid hours represent normal paid hours PLUS overtime, call back or standby hours.

Hours, Overtime — Hours paid over and above normal paid hours. This includes unscheduled overtime, call back, or standby. These may have a different rate of pay from normal hour (eg., time and half) but one normal paid hour and one hour of overtime each count as only one paid hour.

Hours, Worked — Worked hours are paid hours MINUS vacation, sick time and any other paid time off. This represents the time actually available for work.

Indicator — A ratio or other number derived from a set of data and used as an index or measure of the relationship of one dimension to another.

Inpatient — A source of request for laboratory service emanating from individuals who have been admitted to hospital and to whom beds have been assigned.

Item for Count — This defines for each procedure what must be counted to obtain the raw total to which the unit value is applied.

The following terms are used as items for count. They are listed in their specific context at the beginning of each section in which they are used.

Adsorption — A mixture of serum and adsorbing antigens used when separating antibody mixtures.

Antigen — Detectable characteristics which can be identified by reaction with an antibody or lectin. This term may be used for antigen/antibody reactions regardless of whether the antigen is the reagent or the constituent under investigation.

Block	Sedimented material embedded or frozen for histologic processing.
Case	Each autopsy.
Cell Reagent (Cellrg)	A reagent prepared from cellular products.
Donor	An individual who is used as a source of biological material. This term is used for procedures requiring a donor.
Grid	A device on which material is placed for viewing through the Electron Microscope.
Injection	The method by which material is introduced through the portal of a chromatographic instrument.
Jar	An apparatus used in Microbiology to produce non-aerobic atmospheric conditions.
Membrane	The whole surface upon which material to be examined is retained.
Organism	One pure isolate.
Panel Run	The testing of a patient's serum against a selected group of any number of cells in any number of phases run concurrently.
Pack	1. Blood or blood products from a single donor 2. A vial of fractionation products
Patient	An individual under medical care and treatment. This is used as an item for count when the presence of the patient is required for the performance of the procedure.
Per 100	The counting of each 100 elements (eg., cells)
Plate	Refers to the medium in which immunoelectrophoresis is carried out.
PBT (Plate, Bottle, Tube)	Containers for media used to culture micro-organisms. A biplate is considered to be two plates.
Print	Each copy developed from photographic film.
Reading	A visual inspection of Microbiology cultures.
Slide	A flat piece of glass on which material is placed for microscopic viewing.
Smear	The material placed on a glass slide for microscopic viewing. There may be more than one smear per slide.
Specimen	Generally a specimen is defined as a biological sample received for analysis on which a number of related procedures are performed. Specifically, it has 2 applications as an item for count. 1. When the unit value relates to activities not resulting in reportable patient answers, eg., initial handling, preparation of smear. 2. When the unit value relates to the production of multiple test results eg., urinalysis, blood cell profiles.
Surgical Specimen	All the tissue removed at a single surgical setting regardless of number of sites or number of tissue types.
Test	A defined activity leading to a single patient result.
Trip	Travel from the laboratory to a remote site and back.
Laboratory Workload Unit	One minute of composite technical, clerical, and lab aide time spent actively engaged in the production of patient answers.

Outpatient A source of request for laboratory service emanating from individuals who have been formally accepted by the hospital and have received diagnostic and therapeutic service without being admitted. This includes private outpatients as well as patients attending a day or night care unit.

Permanent (P) Unit Value A unit value assigned to a procedure or instrument based on the results of a sufficient number of edited time studies.

Procedure A sequence of technical, clerical, and lab aide steps constituting a laboratory activity listed in the Schedule of Unit Values. An **automated procedure** is one in which most of the analytical steps are performed by an instrument. A **manual procedure** is one in which the analytical steps are performed by hand.

Productivity The ratio of outputs (eg., units of work) to inputs (eg., paid or worked hours). Productivity is a measure of efficiency i.e. the extent to which output is maximized with minimum input.

Productivity Index Productivity expressed as a percent.
eg., Paid Productivity Index = $\frac{44 \text{ units/Paid Hour}}{60} \times 100$

Profile A device used to simplify the collection of workload statistics. A profile may have constant or variable components, (see section on profiling in the Introduction to the Manual).

Quality Control Reference samples or pure solutions run for the purpose of monitoring the accuracy and precision of the method. This includes external proficiency surveys. When counted separately quality control samples receive the same unit values as unknowns.

Raw Count The total tally of items for count.

Referred-in A source of request for laboratory service encompassing specimens received from other hospitals or physicians' offices, and those sent to the laboratory for public health purposes. These patients are neither in-patients nor out-patients of the reporting hospital.

Repeat A procedure performed to solve a problem encountered in a sample run. To qualify as a repeat all the steps subsequent to the initial handling of the specimen must be performed.

The routine performance of duplicate analysis simply for quality assurance purposes, i.e. without a reasonable probability of discrepant results, does not qualify as a repeat.

Repeat procedures receive the same unit value as the original.

Replicate The planned multiple performance of certain steps. Where this is an integral part of the method, it has been incorporated in the unit value assigned. **Replicates are never added to the raw count.**

Research A source of request for laboratory service emanating from research or experimental programs within the hospital.

Staff Health See Employee Health.

Staffing Category A grouping of personnel by function in the context of the Laboratory Workload Measurement System. (see Applications Section of the manual)

Unit-Producing Staff (Category 2) are those personnel whose **primary function** is to carry out the activities which are credited with units of service. The requirements for staff in this category are directly related to workload.

Staffing Category Cont'd

Others (Category 3) are those personnel whose primary function is the administration or enhancement of laboratory service. The requirements for staff in this category are related to the degree of sophistication or the complexity of the laboratory services required in any given institution.

Step

A well defined single function such as logging-in, pipetting, inoculating, etc.

Temporary (T) Unit Value

A unit value assigned to a procedure or instrument based on the results of a limited number of edited time studies or extrapolated from components of previous time studies on similar procedures or instruments.

Unit Value

The number of units (minutes) of composite technical, clerical, or lab aide time required to complete a defined procedure **Once.**

Workload

The sum of all the products obtained by multiplying the raw count for each procedure by its unit value.

APPENDIX C

Alphabetical Index

The following abbreviations are used to indicate in which section the line item may be found.

SPD	Specimen Procurement and Dispatch
Chem	Chemistry
AutoC	Automated Chemistry
Hema	Hematology
AutoH	Automated Hematology
ImmH	Immunohematology
AP	Anatomic Pathology
AP/SP	Surgical Pathology
AP/CY	Cytopathology
AP/CG	Cytogenetics
AP/EM	Electron Microscopy
AP/IP	Immunopathology
Micro	Microbiology
Misc	Miscellaneous
L/SA	Ligand/Saturation Analysis (Chemistry)

ALPHABETIC INDEX

PROCEDURE	UNIT VALUE	ITEM FOR COUNT	SECTION	CODE NUMBER
5 - Hydroxyindoleacetic Acid (5-HIAA)	22	Test	Chem	00636
5 - Hydroxyindoleacetic Acid (5-HIAA) Qual.	9	Test	Chem	00638
Abbott - Biochromatic Analyzer 50, 100, 200 or VP - Each additional analysis	3.5 1	Specimen Specimen	AutoC	
Abbott-TDX (analysis including protein precipitation)	T 4	Test	AutoC	
Abbott-TDX (most analyses)	T 3	Test	AutoC	
ABO Hemolysin Test	5	Test	ImmH	01670
Acetone Qual. - Dipstick	3	Test	Chem	00403
Acetone Quant.	10	Test	Chem	00404
Acid Fast - Ziehl - Neelsen	17	Slide	AP/IP	04503
Acid Hemolysin Test - Hamm Test	18	Test	Hema	01202
Acid, Free or Total - Duodenal or Gastric	3	Specimen	Chem	00406
Acridine Orange	2	Smear	Micro	08856
Acridine orange - Fungi	12	Slide	AP/IP	04504
Activated Partial Thromboplastin Time (Partial Thromboplastin Time) - manual or fibrometer	5	Test	Hema	01312
Additional sections: cut only	2	Slide	AP/SP	03781
Additional sections: cut, stain (H & E, HPS) and mount	4	Slide	AP/SP	03782
Additional sections: cut and stain	4	Slide	AP/SP	04376
Additional sections: cut only	2	Slide	AP/SP	04202
Agglutination test single antigen	20	Organism	Micro	09271
Air sampling - settle plate	5	PBT	Micro	09437
Air sampling by Impinger	10	PBT	Micro	09443
Air sampling by slit samplers	8	PBT	Micro	09440
Alanine Aminotransferase ALT (SGPT)	7	Test	Chem	00922
Albumin	12	Test	Chem	00860
Alcian Blue	17	Slide	AP/IP	04507
Alcohol	49	Test	Chem	00415

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PROCEDURE	UNIT VALUE	ITEM FOR COUNT	SECTION	CODE NUMBER
Alcoholic Hyaline	23	Slide	AP/IP	04508
Aldosterone - See ligand/saturation analysis			Chem	00413
Alphafetoprotein - See ligand/saturation analysis			Chem	00419
Ames - Clinitek (urinalysis)	T 3	Specimen	AutoC	
Ames Seralyzer	T 3	Test	AutoC	
Amido Black - Hemoglobin	23	Slide	AP/IP	04509
Amino Acids, Total - Chemical - Urine	12	Test	Chem	00418
Amino Levulinic Acid - Urine	40	Test	Chem	00420
Ammonia	39	Test	Chem	00422
Amniotic Fluid Scan	20	Test	Chem	00423
Amylase	10	Test	Chem	00425
Amyloid (eg., Congo Red)	12	Slide	AP/IP	04510
Animal Inoculation for any purpose	100	Animal	Micro	08940
Antibiotic Susceptibility Preparation	15	Organism	Micro	08977
Antibiotic Susceptibility Reading plus control	3	Organism	Micro	08978
Antibiotic testing by manual method for 1 organism including controls	75	Antibiotic	Micro	09123
Antibody adsorption	5	Adsorp.	ImmH	02507
Antibody Identification	18	panel run	ImmH	01800
Antibody Titration	T 20	Antigen	ImmH	01830
Antistreptolysin O estimation - Microtechnique	40	Specimen	Micro	09344
Antistreptolysin O estimation, tube dilutions	30	Specimen	Micro	09341
Antithrombin III, synthetic substrate assay (excluding Dupont ACA)	T 50	Test	Hema	01313
API 10S	T 4.5	Organism	Micro	09003
API 20A	8	Organism	Micro	09001
API 20C	T 6	Organism	Micro	09180
API 20E	T 6	Organism	Micro	09002
API 20S	T 6	Organism	Micro	09004

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PROCEDURE	UNIT VALUE	ITEM FOR COUNT	SECTION	CODE NUMBER
API Neident	T 5	Organism	Micro	09010
API Staphident	T 5	Organism	Micro	09011
Argentaffin (eg., Fontana)	17	Slide	AP/IP	04514
Arylsulphatase	2	Organism	Micro	08968
Ascorbic Acid	25	Test	Chem	00427
Aspartate Aminotransferase AST (SGOT)	7	Test	Chem	00920
Atomic Absorption	T 5	Test	AutoC	
Auramine O - T.B.	17	Slide	AP/IP	04515
Autobac	7	Organism	Micro	09076
Autohemolysis Studies			Hema	01110
Autopsy Pathology: Autopsy Attendant	200	Case	AP/SP	03308
Autopsy Pathology: Clerical functions	200	Case	AP/SP	03356
Autopsy Pathology: Technical function	5	Block	AP/SP	03358
Autoscan with Data Management System	T 13	Organism	Micro	09044
Autoscan without Data Management System	T 6.5	Organism	Micro	09046
Bactec for Id	T 13	PBT	Micro	08960
Barbiturates Qual.	32	Test	Chem	00430
Barbiturates Quant.	44	Test	Chem	00434
Beckman - Astra 4, 8	3	Specimen	AutoC	
Beckman - Cl/CO_2 Analyzer	2.5	Specimen	AutoC	
Beckman - E4A Electrolyte Analyzer	T 3	Specimen	AutoC	
Beckman - Glucose and/or BUN Analyzers	2.5	Specimen	AutoC	
Beta Lactamase	T 1.5	Organism	Micro	09106
Bicarbonate - Titration	8	Test	Chem	00502
Bielschowsky	100	Slide	AP/IP	04534
Bile - Stein's or Gmelin's	12	Slide	AP/IP	04568
Bile Pigments Qual. - Urine	6	Test	Chem	00440
Bilirubin Qual. - Feces	5	Test	Chem	00444
Bilirubin Total and Direct	16	Test	Chem	00446

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PROCEDURE	UNIT VALUE	ITEM FOR COUNT	SECTION	CODE NUMBER
Bilirubin Total or Direct	11	Test	Chem	00448
Bioassay	45	PBT	Micro	09126
Biochemical - conventional tube methods, includes reading eg. coagulase, TS1, etc.	1.5	PBT	Micro	08916
Biochemical - plate method, includes reading - eg. DNase	1.5	PBT	Micro	08917
Bleeding Time	11	Patient	Hema	01115
Blood Cultures - Bactec 460	5	PBT	Micro	08932
Blood Cultures - Bactec 460/461	T 6.5	PBT	Micro	08935
Blood Cultures - Dupont Isolator	T 9	PBT	Micro	08938
Blood Cultures - Manual	6	PBT	Micro	08930
Blood Film Examination	11	Slide	Hema	01116
Blood Film Screen	5	Slide	Hema	01118
Blood Gas: manual calibration, manual calculation	20	Specimen	AutoC	
Blood Gas: manual calibration, self calculation	12	Specimen	AutoC	
Blood Gas: self calibration, self calculation	4	Specimen	AutoC	
Blood pack collected from donor	22	Donor	ImmH	02524
Blood Qual. - Dipstick	3	Test	Chem	00452
Blood, Occult - Feces	6	Test	Chem	00450
Bodian (Nerve Fibers)	17	Slide	AP/IP	04536
Bone Marrow - Differential	8	100 Cell	Hema	01275
Bone Marrow Aspiration and Film Preparation	36	Patient	Hema	01280
Bone Marrow Film Preparation in Laboratory	15	Patient	Hema	01276
Bone Marrow Stain Romanowsky	12	Specimen	Hema	01278
Bowies, J.G.	23	Slide	AP/IP	04537
Bromides	15	Test	Chem	00456
Bromosulphthalein	11	Test	Chem	00458
Broth Disk method for Anaerobes	T 1.5	PBT	Micro	09122
Brucella Agglutination test if performed simultaneously with enteric agglutination test	5	Antigen	Micro	09281

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PROCEDURE	UNIT VALUE	ITEM FOR COUNT	SECTION	CODE NUMBER
Buffy Coat Preparation and Interpretation	16	Patient	Hema	01117
C reactive protein by capillary tube method	2	Specimen	Micro	09261
Calcium	6	Test	Chem	00462
Calcium (eg. Von Kossa)	12	Slide	AP/IP	04541
Calcium 24 Hr. Excretion - Feces	93	Test	Chem	00464
Calcium, Sulkowitch - Urine	7	Test	Chem	00470
Calculation - Special	3	Specimen	Chem	00791
Calculus Analysis	25	Test	Chem	00472
Capillary Puncture	12	Patient	SPD	00214
Carbon Dioxide, Total	14	Test	Chem	00503
Carbon Monoxide	23	Test	Chem	00500
Carcinoembryonic Antigen - See ligand/saturation analysis			Chem	00474
Carotene	8	Test	Chem	00476
Case review	T 5	Specimen	AP/SP	03701
Catalase	2	Organism	Micro	08971
Catecholamines - Urine	80	Test	Chem	00478
Cell Count with Cytospin, Film and Differential	T 21	Test	Hema	01125
Cell Count with Film and Differential	18	Test	Hema	01124
Centrifichem - Union Carbide (Baker Diagnostics) - Each additional analysis	4 1	Specimen Specimen	AutoC	
Ceruloplasmin (Copper Oxidase)	19	Test	Chem	00486
Chlamydospore Production	T 3	PBT	Micro	09193
Chloride Sweat Test	33	Test	Chem	00969
Chlorides	6	Test	Chem	00488
Chloroacetate Esterase	T 20	Specimen	Hema	01480
Cholesterol, Total - With Extraction	10	Test	Chem	00499
Cholesterol, Total - Without Extraction	7	Test	Chem	00498
Cholinesterase	30	Test	Chem	00497

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PROCEDURE	UNIT VALUE	ITEM FOR COUNT	SECTION	CODE NUMBER
Chromosome Karyotype: Tissue	T 390	Specimen	AP/CG	04130
Chromosome Karyotype: Amniotic Fluid	465	Specimen	AP/CG	04100
Chromosome Karyotype: Bone Marrow or Peripheral Blood	T 760	Specimen	AP/CG	04120
Chromosome Karyotype: Peripheral Blood	315	Specimen	AP/CG	04110
Circulating Anticoagulant Studies			Hema	01133
CK Isoenzyme Qual. - Electrophoresis	12	Specimen	Chem	00521
Clot Lysis Time, dilute whole blood	10	Test	Hema	01146
Clot Retraction, qualitative	6	Test	Hema	01128
Clotting Time, whole blood	24	Patient	Hema	01130
Coag A Mate - PT and PTT run simultaneously	4	Specimen	AutoH	
Coag A Mate - single PT or PTT	4	Test	AutoH	
Cobas - Bio - Hoffman - LaRoche - Each additional analysis	T 3.5 T 1	Specimen Specimen	AutoC	
Cold Agglutinins Qualitative			ImmH	01134
Cold Agglutinins Quantitative			ImmH	01136
Colony count on membrane filter	3	Filter	Micro	09433
Complement Fixation Test - single antigen	20	Organism	Micro	09358
Complex stains eg. Giemsa or PAS	10	Smear	Micro	08866
Cone and Penfield	100	Slide	AP/IP	04546
Confirmatory Typing of donor pack	2	Pack	ImmH	02000
Congo Red	13	Test	Chem	00509
Connective Tissue (eg., Masson's)	17	Slide	AP/IP	04547
Coombs test for detection of Brucella agglutinins	20	Organism	Micro	09284
Copper (Chemical Method)	40	Test	Chem	00511
Corticosterone - See ligand/saturation analysis			Chem	00517
Cortisol - See ligand/saturation analysis			Chem	00514
Counting of up to 25 additional cells from the same culture and using the routine staining procedure. All specimen types	T 56	Specimen	AP/CG	04140

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PROCEDURE	UNIT VALUE	ITEM FOR COUNT	SECTION	CODE NUMBER
Coverslip prep for mycoplasma	10	Prep	Micro	09542
Creatine	26	Test	Chem	00518
Creatine Kinase (CK)	7	Test	Chem	00520
Creatinine	10	Test	Chem	00522
Cresyl Violet	12	Slide	AP/IP	04540
Crossmatch (no donor typing)	5	Pack	ImmH	02010
Crossmatch (with donor typing)	7	Pack	ImmH	02020
Cryofibrinogen	15	Test	Hema	01138
Cryoglobulin Qual.	9	Test	Chem	00532
Cryoprecipitate, thaw & pool	3	Pack	ImmH	02529
Culture of material on membrane filter	10	Filter	Micro	09430
Cystine (Nitroprusside) Qual.	8	Test	Chem	00536
Cytohormonal evaluation	10	Specimen	AP/CY	04091
D.N.A. (eg., Feulgen)	17	Slide	AP/IP	04554
Darkfield	10	Smear	Micro	08852
Decalcification	3	Specimen	AP/SP	03632
Deoxycortisol - See ligand/saturation analysis			Chem	00539
Develop film, enlarge and print	6	Print	AP/EM	08601
Dienes Stain for mycoplasma colonies	3	Smear	Micro	09520
Digestion of Sputa, etc.	T 3	Specimen	Micro	08953
Digitoxin - See ligand/saturation analysis			Chem	00542
Digoxin - See ligand/saturation analysis			Chem	00545
Direct Smear - preparation and reading	T 7	Smear	Micro	09205
Disks - disk more than two for identification includes reading, e.g. X/V factor (not Kirby Bauer)	2	Organism	Micro	08922
Disks - single disk for identification, includes reading - eg. Bacitracin, optochin, novobiocin	1.5	Organism	Micro	08920
Dispatch of all specimens except Microbiology organisms	6	Specimen	SPD	00182

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PROCEDURE	UNIT VALUE	ITEM FOR COUNT	SECTION	CODE NUMBER
Dispatch of Microbiology organisms to other laboratories	10	Specimen	SPD	00326
DMS rapIDe	T 6	Organism	Micro	09014
Donath - Landsteiner	23	Test	Hema	01148
Dupont - ACA	3.5	Specimen	AutoC	
Each additional karyotype in excess of 3 done on the same banding procedure. All specimen types	T 23	Karyotype	AP/CG	04145
Each reading of cultures (Mycobacteriology)	1	PBT	Micro	09178
Each reading of cultures (Mycology)	1	PBT	Micro	09178
ECG (Technical and Clerical)	26	Patient	Misc	05463
ECG Fetal	30	Patient	Misc	05482
EEG (Technical and Clerical)	120	Patient	Misc	08495
Elastic Tissue (eg., Verhoeff)	12	Slide	AP/IP	04563
Embedding, cutting, staining (H & E, HPS) and mounting	5	Block	AP/SP	03058
Enteric Agglutination Test (Widal)	25	Organism	Micro	09274
Enterotube/Oxiferm	3	Organism	Micro	09016
Enzymes (eg., Gomori, D.O.P.A., Dehydrogenases)	23	Slide	AP/IP	04566
Enzymes, Others	10	Test	Chem	00574
Eosinophil Count Total	8	Test	Hema	01154
Eosinophil Nasal Smear	6	Slide	Hema	01292
Estimation of colony forming units	10	Ea. Addn Reading	Micro	09539
Estimation of colony forming units	30	Single Reading	Micro	09537
Estrogens, Pregnancy - Spectrophotometric - Urine	T 14	Test	Chem	00857
Estrogens, Specific (Estradiol) - See ligand/ saturation analysis			Chem	00577
Euglobulin Lysis Time (coagulation)	20	Test	Hema	01157
Euglobulin Lysis Time (Routine)	20	Test	Hema	01157
Examination of Hair by Ultra Violet Light	3	Specimen	Micro	09128

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PROCEDURE	UNIT VALUE	ITEM FOR COUNT	SECTION	CODE NUMBER
F.A. from isolate	4	Organism	Micro	08860
Factor II Assay	37	Test	Hema	01332
Factor IX Assay	55	Test	Hema	01168
Factor V Assay	55	Test	Hema	01162
Factor VII Assay	55	Test	Hema	01164
Factor VIII Assay	55	Test	Hema	01166
Factor X Assay	40	Test	Hema	01170
Factor XI Assay	60	Test	Hema	01172
Factor XII Assay	60	Test	Hema	01174
Factor XIII (Urea Solubility Method)	10	Test	Hema	01175
Fat (Neutral Fat)	23	Slide	AP/IP	04850
Fat Qual. - Feces	6	Test	Chem	00584
Fat, Total - Feces	T 55	Test	Chem	00588
Fatty Acids (eg., Fischler)	23	Slide	AP/IP	04852
Fatty Acids Free	25	Test	Chem	00594
Ferritin - See ligand/saturation analysis			Chem	00589
Fibrin Degradation Products - Ethanol Gelation Test	6	Test	Hema	01155
Fibrin Degradation Products - Latex Slide Test	8	Test	Hema	01184
Fibrinogen - Chemical Analysis	28	Test	Chem	00865
Fibrinogen Chemical Quantitative	28	Test	Hema	01330
Fibrinogen Screening Test (Thrombin Time)	6	Test	Hema	01176
Fibrinogen, Screening Test	6	Test	Chem	00866
Fibrinolysis (plate method)	16	Test	Hema	01180
Fibrinolysis, Clot Observation	7	Test	Hema	01182
Flame Photometer (Lithium only)	7	Specimen	AutoC	
Flame Photometer - Dual Channel (Na and K)	4	Specimen	AutoC	
Fluorescent Stain (Auramine Rhodamine)	5	Smear	Micro	08944
Fluorescent stain for Mycobacteria	5	Smear	Micro	08862

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PROCEDURE	UNIT VALUE	ITEM FOR COUNT	SECTION	CODE NUMBER
Fluorescent Treponemal Antibody	85	Serum	Micro	09363
Fluorescent Treponemal Antibody	30	Serum	Micro	09366
Folate - See ligand/saturation analysis			Chem	00593
Folates - Microbiological Method - RIA Method	45	Test	Hema	01190
Follicle Stimulating Hormone (FSH) - See ligand/ saturation analysis			Chem	00595
Formal Ether Concentrate, includes preparation of smears	T 4	Specimen	Micro	09208
Frozen sections for rush diagnosis	15	Specimen	AP/SP	04378
Fructose	14	Test	Chem	00932
Fungus (Methenamine Silver)	23	Slide	AP/IP	04578
Fungus (P.A.S. Counterstain) Gridley's	23	Slide	AP/IP	04577
Galactose Tolerance - as Glucose Tolerance		Test	Chem	00934
Gamma Glutamyl Transpeptidase	7	Test	Chem	00600
Gas Liquid Chromatography	T 16	Organism	Micro	09119
Gas Liquid Chromatography - each repeat injection	7	Organism	Micro	09120
Gastric - Electrometric Titration	7	Test	Chem	00605
Gastrin - See ligand/saturation analysis			Chem	00607
Gemini or Flexigem - Electronucleonics - Each additional analysis	T 3.5 T 1	Specimen Specimen	AutoC	
Gemsaec Electronucleonics - Each additional analysis	4 1	Specimen Specimen	AutoC	
Germ tube	T 2	PBT	Micro	09192
Giemsa	12	Slide	AP/IP	04583
Gilford Systems - 203, 203-S, 3400, 3500, Impact 400 - Each additional analysis	3.5 1	Specimen Specimen	AutoC	
Gilford Systems 4, 5, 102, 201, 202	T 4	Test	AutoC	
Glees and Marsland	30	Slide	AP/IP	04584
Globulin	12	Test	Chem	00867
Glucose	8	Test	Chem	00944

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PROCEDURE	UNIT VALUE	ITEM FOR COUNT	SECTION	CODE NUMBER
Glucose Tolerance			Chem	
Glucose 6 Phosphate Dehydrogenase (Qual.)	10	Test	Hema	01398
Glucose Qual. - Dextrotest, Dextrostik, or Dipstick	3	Test	Chem	00942
Glycogen - (P.A.S.)	17	Slide	AP/IP	04585
Gonadotropins - see FSH and LH			Chem	00610
Gram stain - blood cultures	3	Smear	Micro	08844
Gram stain - direct from smear	T 4	Smear	Micro	08840
Gram stain - for morphology	2.5	Smear	Micro	08842
Grams	17	Slide	AP/IP	04587
Greiner - GSA II, G 300	T 3	Specimen	AutoC	
Gross: technical assistance	4	Specimen	AP/SP	03075
Growth Hormone - See ligand/saturation analysis			Chem	00616
Growth Inhibition test	10	Test	Micro	09534
Hall's Stain	12	Slide	AP/IP	04591
Handling and reporting of processed slides	T 5	Specimen	SPD	00184
Haptoglobin - Electrophoresis	26	Test	Chem	00626
Haptoglobin Qual.	15	Antigen	Chem	00625
Heinz Bodies Induction Test	20	Test	Hema	01208
Heinz Bodies, Direct	15	Test	Hema	01206
Hemadsorption - inhibition test	30	Tissue	Micro	09573
Hemadsorption Test	15	Test	Micro	09531
Hemagglutination - inhibition test	30	Tissue	Micro	09570
Hematocrit, Macro or Micro	3	Test	Hema	01210
Hemoglobin	5	Test	Hema	01212
Hemoglobin Electrophoresis	25	Test	Hema	01214
Hemoglobin Fetal (Alkali Denaturation)	31	Test	Hema	01216
Hemoglobin Fetal Qualitative (Feces)	12	Test	Hema	01219
Hemoglobin Fetal-Acid Elution (Kleihauer Betke)	T 8	Slide	Hema	01218

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PROCEDURE	UNIT VALUE	ITEM FOR COUNT	SECTION	CODE NUMBER
Hemoglobin Fetal-Acid Elution (Kleihauer Betke)	T 8	Slide	ImmH	01218
Hemoglobin Plasma	15	Test	Hema	01220
Hemoglobin, Qual. - Spectroscopic - Urine	5	Test	Chem	00624
Hemolysin/Complement checkerboard	85	Test	Micro	09357
Hemolysis test for Mycoplasma pneumoniae	10	Test	Micro	09529
Hemosiderin (eg., Perls')	12	Slide	AP/IP	04592
Hemosiderin - Urine	3	Test	Chem	00628
Heparin, protamine titration	50	Test	Hema	01224
Hepatitis Associated Antigen - See Manual Chemistry Ligand/Saturation Analysis			Micro	09589
Histocompatability - Tissue Cross Match (Only)	150	Patient	Misc	08501
Histocompatability - Tissue Cross Match and Typing Performed on a Patient at the Same Time	250	Patient	Misc	08503
Histocompatability - Tissue Typing (Only)	210	Patient	Misc	08502
Hitachi 705 - BMC	T 3	Specimen	AutoC	
Holmes	30	Slide	AP/IP	04596
Holzer	30	Slide	AP/IP	04597
Homocystine Qual.	8	Test	Chem	00631
Homogentisic Acid	9	Test	Chem	00632
Hycel 10, 17 or HMA 16	T 5	Specimen	AutoC	
Hydroxybutyric Dehydrogenase	10	Test	Chem	00633
Hydroxyprogesterone - See ligand/saturation analysis			Chem	00635
Identification of worm or arthropods	10	Specimen	Micro	09212
IL - Multistat III - Each additional analysis	T 3.5 T 1	Specimen Specimen	AutoC	
Immunodiffusion Qual.	10	Antigen	Chem	00641
Immunodiffusion, each additional Antigen	8	Antigen	Chem	00640
Immunodiffusion, first Antigen	10	Antigen	Chem	00639
Immunoelectrophoresis	40	Plate	Chem	00642
Immunofluorescence - Direct	T 4	Slide	AP/IP	05305

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PROCEDURE	UNIT VALUE	ITEM FOR COUNT	SECTION	CODE NUMBER
Immunofluorescence - Indirect	T 6	Slide	AP/IP	05306
Immunofluorescence analysis of serum antibodies by any kit method	T 6	Antigen	AP/IP	05310
Immunofluorescence analysis of serum antibodies by any kit method; titration of positive	T 12	Antigen	AP/IP	05311
Immunoglobulin E, Total or Specific - See ligand/ saturation analysis			Chem	00643
Immunoperoxidase - By other methods eg. PAP, Avidin Biotin procedures	T 8	Slide	AP/IP	05321
Immunoperoxidase - direct	T 5	Slide	AP/IP	05320
Indices (MCV, MCH, MCHC) Manual Calculation	2	Specimen	Hema	01102
Initial Handling - Immunopathology	8	Specimen	AP/IP	05300
Initial Handling - Microbiology (except Serology)	8	Specimen	Micro	08822
Initial Handling - Non-gynecological	10	Specimen	AP/CY	03930
Initial Handling - Serology	T 5	Specimen	Micro	08823
Initial Handling - Surgical Pathology	14	Specimen	AP/SP	03056
Initial identification - gynecological	10	Specimen	AP/CY	03928
Inoculation	1	PBT	Micro	08956
Insulin - See ligand/saturation analysis			Chem	00647
Iron	11	Specimen	Hema	01236
Iron Hematoxylin Stain & Read (Microscopy)	T 14	Smear	Micro	08870
Iron Hematoxylin Stain & Read (Parasitology)	T 14	Smear	Micro	08870
Iron, Total	10	Test	Chem	00648
Iron, Total and Binding Capacity	15	Test	Chem	00650
Isocitric Dehydrogenase	13	Test	Chem	00654
Isolation of virus by tissue culture	35	Tissue	Micro	09551
Isolation of virus in eggs	30	Tissue	Micro	09554
Issue of blood, blood components or fractionation products for transfusion	2	Pack	ImmH	02030
KDA (ATS Mode) - American Monitor	3.5	Specimen	AutoC	

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PROCEDURE	UNIT VALUE	ITEM FOR COUNT	SECTION	CODE NUMBER
KDA - American Monitor	T 2.5	Specimen	AutoC	
- Each additional analysis	T 0.6	Specimen		
Keto Acids Qual. - Urine	3	Test	Chem	00682
Kirby Bauer	5	Organism	Micro	09121
Kodak - Ektachem 400	T 3	Specimen	AutoC	
KOH or LPCB - Direct Smear (Microscopy)	3	Smear	Micro	08868
KOH or LPCB - Direct Smear (Mycology)	3	Smear	Micro	08868
L.E. Cell Preparation and Examination	28	Test	Hema	01264
Lactate Dehydrogenase (LDH)	7	Test	Chem	00706
Lactate Dehydrogenase Isoenzymes Qual.			Chem	00710
- Electrophoresis	12	Specimen		
Lactic Acid	27	Test	Chem	00702
Lactic and Pyruvic Acids Together	58	Test	Chem	00703
Lactose Qual. - Urine	6	Test	Chem	00948
Lancefield grouping	7	Organism	Micro	09102
Latex for rheumatoid factor quantitative	20	Specimen	Micro	09325
Lead or mercury (Chemical Method)	40	Test	Chem	00720
Lecithin/Sphingomyelin Ratio	15	Test	Chem	00722
Lendrum's Phloxin Tartrazine	17	Slide	AP/IP	04598
Leptospiral Agglutination test 4-6 serum dilutions - single antigen	30	Organism	Micro	09319
Lipase	22	Test	Chem	00724
Lipids, Total	T 10	Test	Chem	00726
Lipofuscin (eg., Schmorl's)	17	Slide	AP/IP	04915
Lipoprotein Electrophoresis	12	Specimen	Chem	00567
Liquifaction of Sputum	3	Specimen	Micro	08889
Lithium - see Chemical Analyzers Group IV			Chem	00728
LKB - Reaction Rate Analyzer	3.5	Specimen	AutoC	
- Each additional analysis	1	Specimen		
Luteinizing Hormone (LH) - See ligand/saturation analysis			Chem	00723

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PROCEDURE	UNIT VALUE	ITEM FOR COUNT	SECTION	CODE NUMBER
Luxal Fast Blue - Neuropath. Modification	17	Slide	AP/IP	04637
Lymph Nodes Film Preparation	33	Patient	Hema	01270
Lyophilized factor - reconstitution of concentrate	5	Pack	ImmH	02590
Lysergic Acid Diethylamide (LSD) - See ligand/ saturation analysis			Chem	00729
Macroglobulins, SIA Test	6	Test	Chem	00730
Magnesium (Chemical Method)	13	Test	Chem	00732
Mann's Stain	17	Slide	AP/IP	04641
Masson Trichrome	17	Slide	AP/IP	04643
Mast Cells - Toluidine Blue	12	Slide	AP/IP	04645
Mayer's Mucicarmine	17	Slide	AP/IP	04646
Media Preparation	0.6	PBT	Micro	08825
Melanin (eg., Fontana)	17	Slide	AP/IP	04922
Melanin Qual. - Urine	10	Test	Chem	00735
Metabolic Tests in diphasic media	4	Test	Micro	09523
Methemalbumin	21	Test	Chem	00740
Methemoglobin or Sulfhemoglobin	21	Test	Chem	00742
Methylene Blue plating test	10	Test	Micro	09526
MIC/MBC preparation per antibiotic series	20	Antibiotic	Micro	09124
Micro ID - 4 hour ID Enterobacteriaceae	5	Organism	Micro	09020
Micromedia - semi auto MIC with frozen plates	T 6	Organism	Micro	09079
Microscan - combo	T 7	Organism	Micro	09054
Microscan or Micromedia - Manual Reader	T 6	Organism	Micro	09050
Miles and Misra Count	7	PBT x 6	Micro	08915
Minitek - anaerobes	9	Organism	Micro	09022
Minitek - non fermenters	T 8.5	Organism	Micro	09026
Morphine - See ligand/saturation analysis			Chem	00747
Ms_2/Avantage ID	T 5	Organism	Micro	09058

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PROCEDURE	UNIT VALUE	ITEM FOR COUNT	SECTION	CODE NUMBER
Ms_2/Avantage susceptibility	T 5	Organism	Micro	09063
Ms_2/Avantage urine screen	T 2	Organism	Micro	09060
Mucin (P.A.S.)	17	Slide	AP/IP	04926
Mucopolysaccharides	30	Test	Chem	00754
Myelin (eg., Luxal Fast Blue)	17	Slide	AP/IP	04927
Myelin (Heidenhain)	23	Slide	AP/IP	04928
Myelin (Marchi's Technique)	50	Slide	AP/IP	04929
Myoglobin - Spectrophotometric - Urine	11	Test	Chem	00756
Neutralization - selected antigens	6	Antigen	ImmH	01820
Neutralization test	40	Tissue	Micro	09576
Neutrophil Alkaline Phosphate (Leukocyte)	18	Specimen	Hema	01450
Niacin	5	Organism	Micro	08965
Nitrogen, Total	12	Test	Chem	00766
Non Specific Esterase	20	Specimen	Hema	01460
Nova 4 + 4 Electrolyte Analyzer	T 3	Specimen	AutoC	
Nova 4 Electrolyte Analyzer	T 4	Specimen	AutoC	
Oil Red O (Simple Fat)	17	Slide	AP/IP	04942
Orcein Giemsa	23	Slide	AP/IP	04665
Osmolality	10	Test	Chem	00776
Osmotic Fragility - Quantitative	45	Test	Hema	01364
Osmotic Fragility Screen	35	Test	Hema	01363
P.A.S. (Periodic Acid Schiff)	20	Specimen	Hema	01465
Parasites Blood (Malarial and other parasites)	22	Specimen	Hema	01274
Partial Thromboplastin Time with Substitution	15	Test	Hema	01310
Paul Bunnell Test	25	Specimen	Micro	09335
Peroxidase	20	Specimen	Hema	01470
PH Routine	3	Test	Chem	00798
Phadebact	3	Organism	Micro	09107

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PROCEDURE	UNIT VALUE	ITEM FOR COUNT	SECTION	CODE NUMBER
Phase Conversion by Craigie tube	4	Organism	Micro	09118
Phenolsulfonphthalein (PSP)	14	Test	Chem	00858
Phenothiazine Qual.	8	Test	Chem	00802
Phenotyping by direct agglutination	T 2	Antigen	ImmH	01650
Phenotyping by indirect antiglobulin test	T 5	Antigen	ImmH	01640
Phenyl Pyruvic Acid Qual.	4	Test	Chem	00810
Phenylalanine	15	Test	Chem	00804
Phenylalanine - Tyrosine Ratio	30	Test	Chem	00806
Phenylketone (PKU)	4	Test	Chem	00835
Phosphatase Acid	10	Test	Chem	00815
Phosphatase, Alkaline	7	Test	Chem	00818
Phosphate Inorganic	7	Test	Chem	00824
Phosphorus Tubular Absorption	23	Test	Chem	00828
Photovolt Stat Ion (Na, K, Cl, CO_2 optional)	T 2	Specimen	AutoC	
Pigments, Abnormal - Spectroscopic	20	Test	Chem	00832
Pinworm or scotch tape preparation	7	Smear	Micro	09211
Placental Lactogen - See ligand/saturation analysis			Chem	00837
Plasma Clotting (Recalcification) Time	8	Test	Hema	01318
Plate toxin-antitoxin reaction	9	Organism	Micro	09093
Platelet concentrate - preparation for infusion including pooling	3	Pack	ImmH	02657
Platelet Count (microscopic)	9	Test	Hema	01326
Platelet Function - Aggregation	6	Tube	Hema	01323
Platelet Function - Factor 3 (PF3)	16	Test	Hema	01329
Platelet Function Retention Tests			Hema	01320
Polymak II	T 4	Test	AutoC	
Pooling of Red Cell Concentrate and Plasma	T 2	Resulting Pack	ImmH	02662
Porphobilinogen	32	Test	Chem	00840

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PROCEDURE	UNIT VALUE	ITEM FOR COUNT	SECTION	CODE NUMBER
Porphobilinogen Qual.	9	Test	Chem	00838
Porphyrins Qual.	10	Test	Chem	00842
Porphyrins Screening Test (Lead)	10	Test	Chem	00844
Porphyrins, Fractionation	67	Test	Chem	00846
Potassium - see Chemical Analyzers				
Pregnancy Test - tube agglutination	2	Tube	Micro	09254
Pregnanediol	40	Test	Chem	00854
Pregnanetriol	40	Test	Chem	00856
Prep of cardiolipin antigen VDRL	5	Prep	Micro	09243
Preparation by centrifugation a) leukocyte poor blood, b) Red Cell Concentrate or c) concentration of platelet concentrate	7	Pack	ImmH	02650
Preparation of cells for Complement Fixation tests	15	Prep	Micro	09356
Preparation of each additional block	6	Block	AP/SP	04375
Preparation of eluate (heat method)	T 30	Specimen	ImmH	01840
Preparation of eluate - lipid solvent	T 13	Specimen	ImmH	01850
Preparation of enzyme treated cells	T 14	Panel run	ImmH	01860
Preparation of fluids by centrifugation	T 7	Specimen	AP/CY	04090
Preparation of fluids by membrane filter technique	T 8	Membrane Filter	AP/CY	04089
Preparation of frozen cells	6	Cellrg.	ImmH	02556
Preparation of leukocyte poor blood by IBM 2991, automated washings	T 20	Pack	ImmH	02240
Preparation of leukocyte poor blood by manual washings	T 10	Pack	ImmH	02230
Preparation of leukocyte poor blood or Red Cell Concentrate by sedimentation	T 2	Pack	ImmH	02220
Preparation of pilot tube on packs received from Red Cross	2	Pack	ImmH	02714
Preparation of sensitized cells including quality control	T 15	Cellrg.	ImmH	02210
Preparation of smears from fine needle aspiration	T 10	Specimen	AP/CY	04093
Preparation of sputa by pick and smear technique	T 6	Specimen	AP/CY	04096

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PROCEDURE	UNIT VALUE	ITEM FOR COUNT	SECTION	CODE NUMBER
Primary isolation of mycoplasma	4	Diphasic Media	Micro	09514
Primary isolation of mycoplasma	4	Solid Media	Micro	09511
Procurement of any specimen for Microbiology culture or dark field microscopy	T 6	Patient	SPD	00320
Profile A (10-12 procedures)	16	Specimen	ImmH	01600
Profile B (7-9 procedures)	13	Specimen	ImmH	01610
Profile C (4-6 procedures)	9	Specimen	ImmH	01620
Profile D (3 or less procedures)	7	Specimen	ImmH	01630
Progesterone - See ligand/saturation analysis			Chem	00879
Prolactin - See ligand/saturation analysis			Chem	00881
Protein 24 Hr. Urine or Fluid	6	Test	Chem	00870
Protein Electrophoresis	12	Specimen	Chem	00566
Protein, Bence Jones, Qual.	18	Test	Chem	00863
Protein, Total - Chemical	8	Test	Chem	00874
Protein, Total - Refraction - Serum	6	Test	Chem	00872
Protein, Total and A/G Ratio	20	Test	Chem	00876
Prothrombin Consumption	20	Test	Hema	01334
Prothrombin Time - Manual or Fibrometer	5	Test	Hema	01336
PTAH	12	Slide	AP/IP	04677
PTAH - Neuropath. Modification	17	Slide	AP/IP	04678
Quellung Reaction including control	5	Organism	Micro	09091
Quinidine	18	Test	Chem	00884
Rapid tests includes reading eg. oxidase, catalase, bile solubility, slide coagulase, etc.	1	Organism	Micro	08914
Read culture - original culture plates (aerobic or anaerobic)	1	Reading	Micro	08905
Receipt of specimens	T 6	Specimen	SPD	00180
Renin - See ligand/saturation analysis			Chem	00887

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PROCEDURE	UNIT VALUE	ITEM FOR COUNT	SECTION	CODE NUMBER
Replicator: 1 unit per organism plus 1 unit x # plates used (Susceptibility Testing)		Organism/ Plate	Micro	09032
Replicator: 1 unit per organism plus 1 unit x # plates used (Systems)		Organism/ Plate	Micro	09032
Reptilase Time	4	Test	Hema	01375
Resin Test for Achlorhydria (Tubeless Gastric Analysis)	11	Test	Chem	00892
Reticulocyte Count	9	Specimen	Hema	01372
Reticulum (eg., G and S)	23	Slide	AP/IP	04972
Return of blood pack to laboratory or Red Cross used or unused	1	Pack	ImmH	02040
Romanes	23	Slide	AP/IP	04695
Rotochem - American Instrument - Each additional analysis	4 1	Specimen Specimen	AutoC	
Saffron (Hematoxylin Phloxine Saffron)	17	Slide	AP/IP	04701
Salicylates Qual.	5	Test	Chem	00902
Salicylates Quant.	12	Test	Chem	00910
Sceptor	T 7	Organism	Micro	09066
Screening (scanning) and photography of grid	20	Grid	AP/EM	05282
Screening (technical) - gynecological	5	Slide	AP/CY	04083
Screening (technical) - Non-gynecological	5	Slide	AP/CY	04084
Sedimentation Rate (E.S.R.)	4	Specimen	Hema	01384
Semen Analysis for the Presence of Sperm Only	5	Patient	Misc	08680
Semen Analysis Inc. Count, Motility and Morphology	15	Patient	Misc	08681
Sensititre	T 9	Organism	Micro	09069
Separation of donor pack into aliquots	15	Pack	ImmH	02715
Serial dilution for Culture	1	Per Dilution	Micro	08890
Serum Bacteriocidal level	20	Specimen	Micro	09153
Set up and open anaerobic jars	3	Jar	Micro	08910
Sex Chromatin Identification	16	Specimen	AP/CG	04099
Sickle Cell Preparation	14	Specimen	Hema	01390

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PROCEDURE	UNIT VALUE	ITEM FOR COUNT	SECTION	CODE NUMBER
Simple stains eg. Methylene Blue Neisser	4	Smear	Micro	08864
Slide Agglutination (Additional Identification Procedures)	1	Antibody-Antigen Reaction	Micro	09250
Slide agglutination (Serology)	1	Antibody-Antigen Reaction	Micro	09250
Slide Culture	15	Culture	Micro	09184
Sodium - see Chemical Analyzers				
Special Preparation of biopsy material	15	Specimen	AP/SP	03785
Specific Gravity	4	Test	Chem	00928
Specimen Handling	60	Specimen	AP/EM	05255
Splenic Film Preparation	33	Patient	Hema	01396
Spore stain	8	Smear	Micro	08846
Steroids Urinary	17	Test	Chem	00925
Streptex six antigens	4	Organism	Micro	09101
Subculture and reading	1.5	PBT	Micro	08908
Subculture on solid or diphasic media	20	PBT	Micro	09517
Sucrose Lysis	T 10	Test	Hema	01221
Sucrose Lysis	T 10	Test	ImmH	01221
Sudan Black	20	Specimen	Hema	01399
Sugar Assimilation	T 7	Test	Micro	09191
Sulfhemoglobin	21	Test	Chem	00964
Sulfonamides	27	Test	Chem	00958
Sulfonamides Crystals Qual.	2	Test	Chem	00960
T3 Resin Uptake Test - See ligand/saturation analysis			Chem	00977
Tartrate Resistant Phosphatase	20	Specimen	Hema	01475
Tease Mount	5	Smear	Micro	09181
Technicon - Auto Analyzer (Dual Channel)	4	Specimen	AutoC	
Technicon - Auto Analyzer (Four Channel)	3	Specimen	AutoC	

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PROCEDURE	UNIT VALUE	ITEM FOR COUNT	SECTION	CODE NUMBER
Technicon - RA 1000	T 3	Specimen	AutoC	
Technicon - SMA 12/60	4	Specimen	AutoC	
Technicon - SMA 6/60	4	Specimen	AutoC	
Technicon - SMAC	T 2.5	Specimen	AutoC	
Technicon - Stat Lyte (Na, K, Cl, CO_2)	T 2.5	Specimen	AutoC	
Technicon Auto Analyzer - Methodology with extraction	6	Test	AutoC	
Technicon Auto Analyzer - Methodology without extraction	4	Test	AutoC	
Test of Sterilization eg. autoclaves	4	Test	Micro	09416
Testosterone - See ligand/saturation analysis			Chem	00970
Testosterone - with Chromatography - See ligand/ saturation analysis			Chem	00971
Thawing of frozen cells	10	Cellrg.	ImmH	02557
Thawing of Plasma	T 2	Pack	ImmH	02665
Thick section: cutting, staining and mounting	10	Slide	AP/EM	05293
Thin sections: cutting, mounting, staining and checking under electron microscope	22	Grid	AP/EM	05295
Thiocyanates	15	Test	Chem	00974
Thyroid Stimulating Hormone - See ligand/saturation analysis			Chem	00975
Thyroxine (T4) - See ligand/saturation analysis			Chem	00978
Tissue grinding	5	Specimen	Micro	08883
Travel time for the transport or procurement of specimens or for the performance of technical functions	8	Round Trip	SPD	00398
Trichrome Stain & Read (Microscopy)	T 8	Smear	Micro	08873
Trichrome Stain & Read (Parasitology)	T 8	Smear	Micro	08873
Triglycerides	12	Test	Chem	00984
Triiodothyronine - See ligand/saturation analysis			Chem	00987
Trypsin Qual.	11	Test	Chem	00990
Tube Agglutination	20	Organism	Micro	09088

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PROCEDURE	UNIT VALUE	ITEM FOR COUNT	SECTION	CODE NUMBER
Unitek N/F	T 8	Organism	Micro	09028
Unna Pappenheim	12	Slide	AP/IP	05005
Urate (Uric Acid)	8	Test	Chem	01010
Urea	7	Test	Chem	01002
Urea Qual. - Dipstick	T 3	Test	Chem	01003
Urinalysis, any single analysis	3	Test	Chem	01013
Urinalysis, routine	4	Specimen	Chem	01014
Urinalysis, routine including Microscopy	6	Test	Chem	01016
Urine Volume - Measurement and Calculation	2	Test	Chem	01017
Urobilin Qual. - Urine	3	Test	Chem	01020
Urobilinogen Qual. - Feces, Urine	10	Test	Chem	01022
Urobilinogen Quant. - Feces	35	Test	Chem	01026
Urobilinogen Semi-Quant. - Urine - 24 Hr. Excretion	12	Test	Chem	01028
Vanilmandelic Acid (VMA)	30	Test	Chem	01042
VDRL, VDRL Quantitative	20	Specimen	Micro	09264
Venipuncture	8	Patient	SPD	00212
Viscosity	4	Test	Chem	01044
Vitamin B_{12} - See ligand/saturation analysis			Chem	01050
Vitek others	T 4	Organism	Micro	09072
Vitek urine screen	T 4.5	Organism	Micro	09070
Wet Prep - eg. for Trichomonas, India Ink or motility	1.5	Smear	Micro	08848
Wet Prep for Trichomonas	T 2	Smear	Micro	08872
White Blood Cell Count - Manual	6	Test	Hema	01444
Worthington Chemetrics analyser	T 3	Test	AutoC	
Xylose	8	Test	Chem	00956
Xylose, Absorption			Chem	
Ziehl-Neelsen - confirmatory from culture (Microscopy)	5	Smear	Micro	08854

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PROCEDURE	UNIT VALUE	ITEM FOR COUNT	SECTION	CODE NUMBER
Ziehl-Neelsen - direct from specimen	20	Smear	Micro	08850
Ziehl-Neelsen on primary specimen	20	Smear	Micro	08950
Ziehl-Neelsen, confirmatory from culture (Mycobacteriology)	5	Smear	Micro	08854

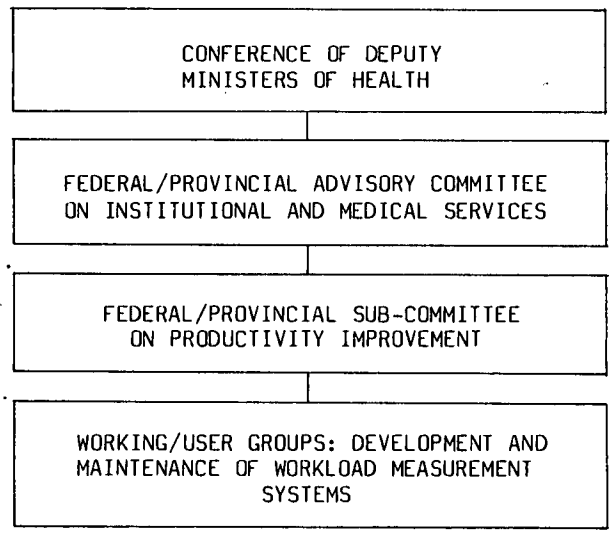
APPENDIX D

The Committee Structure of Workload Measurement Systems

CANADIAN WORKLOAD MEASUREMENT SYSTEMS PROGRAM

The Federal-Provincial Sub-Committee on Productivity Improvement is responsible for directing and coordinating the Canadian Workload Measurement System Program, established nationally on a cooperative Federal-Provincial basis in collaboration with National Professional Associations. Major facets of the program include the developing, promotion, evaluation, maintenance and funding of Workload Measurement Systems. Other functions inherent in the Sub-Committee's mandate includes educational activities, and the preparation, testing, publication and implementation of Workload Measurement Systems.

CANADIAN WORKLOAD MEASUREMENT SYSTEMS PROGRAM



The Canadian Association of Pathologists' Laboratory Workload Measurement Committee is one of a number of the Working/Users Groups.

The Canadian Laboratory Workload Measurement System is co-operatively funded by the Provinces through the Federal-Provincial Advisory Committee on Institutional and Medical Services. Additional resources are provided by the Department of National Health and Welfare and Statistics Canada.

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