Resource Manual

2012

Dedication

The Alliance of Ohio Trauma Registrars wishes to dedicate this resource manual to Kathy Cookman. Due to Kathy's tireless efforts, overwhelming enthusiasm for trauma registry, and selfless dedication, she has created a voice for registrars in the trauma world. We are very grateful to her for her work in creating the Alliance, and maintaining a high level of professionalism and respect that is emulated amongst the trauma community.

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Preface

In Ohio during the late 1980's, the trauma nurse coordinators were the first to meet and officially organize. It was while attending several of those meetings, that a vision arose: gather those responsible for the collection of trauma information in a forum where we could share ideas on how to better accomplish the job responsibilities, ask questions, and learn from one another. During a conversation with the leaders of the trauma nurse coordinator's group, the idea was put forth and enthusiastically supported to establish a statewide registrar support group known as Alliance of Ohio Trauma Registrars (AOTR).

The founder of the Alliance of Ohio Trauma Registrars was Kathy (Jenkins) Cookman who at the time was the trauma registrar for Riverside Methodist Hospitals in Columbus, Ohio. Special recognition goes to Kathy Haley, Trauma Program Manager of Children's Hospital in Columbus, Ohio and Joyce Schmidt, Trauma Coordinator at Riverside Methodist Hospitals, for being supportive of the vision.

The AOTR (Alliance of Ohio Trauma Registrars), through collaboration with one another realized a need for a 'resource manual' to assist new registrars with understanding their objective in performing the job as a trauma registrar. Thus, the development of the manual was crafted to guide all those involved in the care of the trauma patient.

Acknowledgements

Chapter One

History of Registries

Although a registry was originally the place (like Registry House in Edinburgh) where information was collected (in registers), the word registry has also come to mean the collection itself (Medicinenet, 2011). A registry is usually organized so the data can be analyzed. For example, analysis of data in a tumor registry maintained at a hospital may show a rise in lung cancer among women. According to Free Dictionary (2011), a registrar is defined as an official keeper of records.

In the beginning of the 20th century, disease registries were established by public health officials in order to trend tuberculosis patients (Fairchild & Alkon, 2007). Since this time, there has been a growth of registries relating to cancer, rehabilitation, Emergency Medical Services, burn and trauma.

In September 1966, the National Academy of Sciences' National Research Council released the, "Accidental Death and Disability: The Neglected Disease of American Society" report. Also referred to as the "White Paper", the document initiated changes that have evolved into the modern system of trauma care that we see today. Recommendations set forth this document included:

1. Establishment of trauma registries in selected hospitals as a mechanism for the continuing description of the natural history of the various forms of injuries.
2. Subsequent consideration of establishment of a national computerized central registry.
3. Studies on the feasibility of designating selected injuries to be incorporated with reportable disease under Public Health Service control (American Trauma Society [ATS], para 2, 2011).

Historically the document was produced when The Digital Equipment Corporation introduced its PDP-8 computer. Often referred as the "Model-T of computers", it was the first of its kind to allow hospitals to collect data electronically (Iowa, n.d.).

David R. Boyd published the first detailed description of a computerized trauma registry in 1971. The system depicted used keypunch cards to enter data with each patient represented on a set of 16 cards. This system allowed for a thorough evaluation of all aspects of trauma care, including causes, clinical care, and administrative issues (Boyd, Lowe, Baker, & Nyhus, 1973).

In the 1980s, several technological companies created dedicated, powerful and flexible trauma registry software. Among these were Clinical Data Management (CDM), Cales and Associates, Tri-Analytics, and Lancet Technology. These new systems allowed the trauma program to more quickly gather, contain, and analyze patient data in one place.

In May 1989, Trauma Quarterly, the first comprehensive peer review publication on trauma registries, was published. Related topics such as data sets, reports, personnel, data management, and evaluation were included in the full spectrum of trauma registry.

In 1990, the American College of Surgeons Committee on Trauma (ACSCOT) published *Resources for Optimal Care of the Injured Patient*. This manual guides hospitals in their efforts to create a trauma service. Trauma registries are essential criteria for Level I, II and III trauma centers. The American College of Surgeons state that, documentation will be made of severity of injury (by trauma score, age, Injury Severity Score [ISS]) and outcome (survival, length of stay, ICU length of stay) with monthly review of statistics (American College of Surgeons [ACS], 1999). In 1993 the second edition of the ACSCOT revised *Resources for Optimal Care of the Injured Patient* was published, validating the importance of the trauma registry. With each revision that is published, the ACSCOT continues to maintain that importance.

In many states, trauma regions have been developed, making for an organized regional registry. This enables regions to analyze trauma data and statistics from their own repository.

Many states have an organized trauma system, providing trauma data and statistics for statewide injury prevention, legislation and promotion of optimal trauma patient care.

The National Trauma Data Bank (NTDB) is a data repository for any hospital to submit trauma data. In 2006, this submission became mandatory for all hospitals verified by the ACS as trauma centers (ACS, 1999).

Chapter 2

Trauma Registry Data Components

Data Sets

A dataset is a series of records, which were originally created or managed on a computer system. A dataset usually takes the form of fields and tables in which items of data are contained and structured (National archive of Datasets, n.d.). The trauma registry is an example of a dataset.

Datasets are made up of records; records are made up of fields (also known as data elements or variables); and fields are made up of characters. Sometimes there is a limit to the number of records that a dataset may contain. There may be limits to the number of fields allowed in a record, and the number of characters allowed in a field. As information technology continues to advance, limitations on the size of a dataset will cease to exist.

The number of fields in the trauma registry depends on the purpose of the registry, i.e., use of the registry for performance improvement, trending, benchmarking, research, etc. This will determine data elements that need to be collected. Participation in a national, state, regional system, and/or ACS trauma verification process will dictate, at a minimum, data elements to be collected.

The dataset consists of information related to patient demographics, clinical and outcome data. Depending on the purpose of the trauma dataset, it may also include information related to the patient post-discharge. Reporting capabilities are determined by the contents of the dataset.

To understand what each field in a dataset represents, it is important to define each field in a data dictionary. The data dictionary defines the meaning of a field, export qualities and information sources.

Types of Data Sets

National Trauma Data Bank

The NTDB is the largest aggregate of trauma registry data ever assembled (ACS, 2011). NTDB's goal is to collect data on every trauma patient in the United States to inform decision makers about epidemiology, care, and resource allocation in the trauma population (ACS, 2006). To accurately report and compare data submitted, a uniform dataset needs to be adhered to.

State Data

Most states have a data repository that requires data submission from acute care facilities. Depending on the state's alignment with the NTDB dataset, the state's data set may be comparable. It is imperative that the data submission is completed according to the state's timeline and required dataset. Refer to individual state guidelines for specific requirements.

Regional Data

Many facilities are a member of a regional system. Facilities may be required to participate in a regional trauma data submission and will have a data dictionary to guide this process. In some systems, a regional registrar may facilitate the process of state submission.

Facility Data

If the acute care facility is an ACS verified trauma center, data sets must be in line with the NTDB as well as meeting state and regional requirements. Trauma centers may also have additional datasets or fields to assist with research, trauma performance, and education, which may not be exported to any data repositories.

Chapter 3

Identifying Trauma Population and Trauma Types

Trauma population

The Ohio Trauma Registry defines the trauma population as injured patients who are admitted to a facility, transferred to a higher level of care, or died within the Emergency Department. Some variation in this definition will depend on inclusion criteria from the region, state or national dictionary.

The trauma population is identified with injury and external cause codes assigned based upon mechanism of injury and diagnosis. The two most common codes are:

International Classification of Diseases Volume 9 (ICD9) Injury Codes

Injury codes are identified in the 800 thru 959.9 codes in the ICD9 book. There may be some exclusion depending on the inclusion criteria used by the facility, region, state or national repositories.

External Cause Codes (ECodes)

ECodes are found in the ICD9 book. They are a group of codes identified in the ICD9 coding book and describe the external cause of the injury. The range for the external cause of injury is E800-E848.8, E878-E905.0, E906.0-E928.8, E950.0-E999. There are additional ECodes that can be used as supplemental codes to give more specific information of what type of activity the patient was involved in. These codes range from 000.0 thru 030. It is also noted that the ECode group of '849' is used for location of the injury and not for the external cause of injury; such as 849.0 being home and 849.8 being other location.

Trauma Types

Blunt injuries (B)

Blunt trauma occurs from a force during acceleration, deceleration, compression, or shearing. The extent of injury that occurs during a blunt trauma type of mechanism of injury depends on the type of energy that is exerted. If the force is slow, then the energy that is released is also slow resulting in less tissue deformity. However, on the other side, if the force is rapid, then a greater amount of energy is released with the potential to cause more tissue deformity. Examples include:

- Vehicular impact without impalement

- Blunt force trauma as in assault with a non-sharp object (e.g., fists, blunt object).

- Falls

- Blast injuries

- Extremities caught in machinery (not a saw); crush injuries, "belt" injuries

- Pinned between two objects

- Fall onto glass surface NOT resulting in deep penetrating wound

- Punch wall or glass surface NOT resulting in deep penetrating wound

- Struck by object made of glass (e.g., glass bottle, glass pitcher)

Penetrating injuries (P)

Penetrating injuries are caused by a sharp implement that results in penetrating the skin and then deeper in either a cavity or structures such as tendons, nerves, vascular or deep muscle beds. These injuries require more than one layer of suturing.

Examples include:

- Gunshot wounds (including BB guns)

- Stab wounds

- Impalement

- Dog bites

- Nail guns

- Punch/fall through glass resulting in deep penetration

- Paint gun/high pressure liquid injection injuries

Thermal injuries (T)

Thermal injuries are caused by thermal or electrical mechanisms, such as thermal burns, frostbite, or lightning strikes.

Examples include:

- Thermal burns (e.g., fire, flames, scalds, hot liquids/grease)

- Chemical burns

- Hypothermia

- Electrocution

- Lightning strikes

- Taser injuries

- Burns to the airway

Not applicable (NA) or Other

These injuries do not fit into any of the above categories.

Examples include:

- Envenomations: snake bites, spider bites, etc.

- Cat bites, human bites

- Hangings, drownings, suffocations

- Smoke inhalation without burns to the airway

- Carbon monoxide poisoning

Combinations

There are incidents where more than one trauma type occurs during the injury. The trauma registrar decides which trauma type had the greatest impact on probability of survival. Remember, it is not always the most prevalent mechanism of injury that determines whether the blunt, penetrating or thermal had the greatest impact on the patient's outcome. An example would be a driver of a motor vehicle that crashed into a roadside post and part of the post impaled the driver's heart. The impalement to the heart will most likely be the more serious injury, so "penetrating" would be the appropriate trauma type.

Chapter 4

Trauma Members and Committees

The Trauma Department is comprised of different team members who are integrated into many different committees and organizations within the hospital, community, region and state. It is important to recognize and understand the minimum roles of each team member within the department. In a non-verified center, the duties of trauma collection and registry work may fall under the direction of the medical records or coding department.

Trauma Team Members

Medical Director

The Medical Director is typically a board certified surgeon who is responsible for medical administration, quality care, and effective integration of the trauma services. Within these responsibilities, the Medical Director also acts as a liaison with them medical staff, nursing, and pre-hospital providers. He or she is responsible for the trauma performance improvement activities and oversees the utilization review of all admitted trauma patients to ensure the smooth transition of care through the different hospital phases.

Trauma Program Manager or Nurse Coordinator

The trauma program manager (TPM) or nurse coordinator (TNC) is responsible for the management of the trauma program and function in administrative, clinical, education, and quality improvement roles to assure comprehensive care to meet the needs of trauma victims and their families. This person is responsible for assuring the implementation of day to day care of the Trauma Service patients. They also coordinate Trauma Performance Improvement (PI) and

multidisciplinary meetings and assists the Director in reviewing the function and outcome of the

Trauma program. The program manager/coordinator also works closely with pre-hospital

Emergency Medical Services (EMS) to coordinate quality assurance, training and education.

They oversee the trauma registry and in some facilities may perform the duties of the Trauma

Registrar.

Trauma Registrar

The trauma registrar is responsible for abstracting chart data and entering it into the

Trauma Registry, a computerized database providing detailed information on all trauma

patients. Some registrars may be referred to as a Trauma Data Specialist or a Trauma Data

Manager. The registrar provides oversight for the database processes and may fill all or some

of the roles needed throughout the data process. The trauma data specialist or manager may

also oversee others who fulfill the roles needed. The trauma registry role exists in order to

analyze and utilize trauma patient data for performance improvement initiatives, research,

injury surveillance, and trauma systems monitoring (Zougras, Ryan, & Esposito, 2000).

Trauma Registry Coordinator

The trauma registry coordinator is responsible for coordinating activities in the trauma

registry. The coordinator may be the supervisor of the other registrars, responsible for

maintaining integrity, running reports, and upholding deadlines. This position typically exists in

verified trauma centers with large volumes and with more than three registrars on staff.

Injury Prevention Specialist

The injury prevention specialist is responsible for utilizing hospital, regional, state and/or national data to guide prevention activities to reduce injuries. An ACS verified level I and II trauma center must have a budgeted salary and job description for this position. Level I facilities must have a dedicated person other than the TPM/TNC performing these duties.

Outreach Coordinator

The outreach educator is responsible for providing trauma education to individuals and agencies with an outcome goal of improving the care of the trauma patient. This person may also be the coordinator of Advanced Trauma Life Support (ATLS) for physicians, Trauma Nurse Core Course (TNCC) for nurses, and Pre-hospital Trauma Life Support (PTLS) for Pre-hospital providers. Depending on the facility and level of the trauma center, this may be a dedicated person or a specific job duty.

Emergency Medical Services Coordinator

The EMS coordinator is responsible for coordinating pre-hospital education, quality improvement, and assisting with the trauma program. Depending on the state or region, this person may or may not exist.

Other Team Members

Other team members include the medical and ancillary staff who respond to the incoming trauma patients in the emergency department. The type of staff who respond is determined by the activation criteria defined within the trauma centers. Typically centers have a two or three

tier activation response system depending on mechanism of injury, injuries, and physiological status. Examples of ancillary members who respond include operating room staff, radiology, and chaplains.

Committees

Depending on the facility, region, and state affiliation, trauma center status and trauma designating body, the registrar may not be involved in committees, or may be known by another name. The registrar's involvement or membership in these committees is not universal to all registrars.

Trauma Performance Improvement and Patient Safety Program (TPIPSP)

The multidisciplinary peer review committee is one aspect of TPIPSP**.**   This physician driven committee has representatives from neurosurgery, orthopedics, emergency medicine, anesthesia, and other specialties deemed appropriate for the review of the care of the trauma patient.   Mortalities (deaths) and morbidities (the degree or state of the disease or injuries) are usually discussed at this meeting, along with complications and sentinel events.

Trauma Program Operational Process Performance Committee (TPOPPC)

The Trauma Program Operational Process Performance Committee (TPOPPC) is another aspect of TPIPSP. Committee members are a combination of medical and hospital providers. The focus of this committee is to address system issues of the trauma program (ACS, 2006).

Other Hospital Committees

A representative from the trauma program may be asked to sit on other hospital wide committees such as safety, disaster, transplant and research.

External Committees

The facility may be associated with a regional hospital alliance. This alliance may have dedicated committees for trauma. Regional trauma care, process improvement, and trauma education are the focus in these meetings. State committees are dependent on the degree of trauma involvement at state level. Some states may have a highly organized developed trauma system, whereas others are in the process of developing one.

Chapter 5

Data Collection Tools and Methods

Some facilities have the capability to import data from the hospital's mainframe and automatically download a portion of the data. This import can be time saving when data points such as demographics are imported into the trauma database. The hospital software and the vendor software must be compatible in order for an interface of data to be successful.

Whether a registrar chooses to use paper or electronic abstracts, or no abstract at all, it is more of a matter of personal choice than of proper process. An abstract includes all the fields from the registry software. The registrar then fills in these spaces with the pertinent information from the patient chart. Abstracts condense patient information to facilitate quick data entry into the trauma software program. Abstracts are tailor made to each facility, and sometimes to each region. Newer registrars tend to find the abstracts to be helpful as they learn their way around hospital medical records and the trauma software.

Paper Charts

Quickly becoming a relic of the past, paper charts are still in use at some medical centers. This chart type can be tedious to do real time abstraction on, as the registrar will have to travel to the patient's unit to collect current information. With paper charting, there can be a delay for parts of the patient's data to be assembled into a completed medical record.

Electronic

As federal law has dictated a move to EMRs for all hospitals by 2015 (US Department of Health Services, 2011), more and more hospitals are coming online with an electronic system. A benefit of an electronic medical record is the patient's data is stored in a centralized location, updating results, progress notes and dictation in real time. This tends to make chart abstraction easier for the registrar. A registrar may need to work closely with the electronic medical record implementation team to create the reports needed to abstract the data. There are facilities that have a "hybrid" electronic medical record. This means that the hospital medical record is a combination of scanned/electronic record and paper chart.

Methods of Abstraction

Concurrent Abstraction

Whether the facility decides on concurrent or retrospective abstraction, a number of factors have to be taken into consideration. Concurrent abstraction provides a trauma department with synchronous data that allows for expeditious reporting and tracking. Concurrency allows for current trending, which provides for optimal process improvement. To achieve concurrency requires a committed, efficient effort on the part of the registrar, as the hospital chart must be revisited daily for any changes, and if any have been found, the registry must be updated accordingly.

Retrospective Abstraction

Retrospective abstraction allows the registrar to have a complete picture of the patient's care after the patient's discharge date. The registrar does not have to await procedures or

diagnosis. Typically a pre-determined time frame is set up for completion of the chart in the registry, for example, 30, 60, or 90 days post discharge. Reporting is not concurrent, which can make deadlines of exporting data to the region and/or state hard to comply with. It is also important to note that keeping a retrospective database can make documents integral to patient care hard to locate, as paper documents do not always travel to the final destination with the chart. To be an ACS-verified trauma center, it is required to have 80% or more of the trauma patients entered into the registry within 60 days of discharge (ACS, 2006).

Equipment and Software

Some of the equipment required for data collection will include a computer, either a laptop or desktop. Certain facilities, depending on the level and degree of technology, may have handheld devices as well. Trauma software of choice for the reporting facility will need to be on a computer terminal. The brand of software used in the facility differs from location to location. Certain states use all the same software. The NTDS has a listing of software vendors available for trauma reporting. Whichever software is selected, it is recommended that the registrar establish a working relationship with the software vendor's support staff. This allows upgrades to be implemented smoothly and user issues handled in a prompt manner.

Methods of Patient Identification

The trauma patients for inclusion into the database can be found from a variety of hospital-generated reports. For example Emergency Department (ED) logs, admission and discharge reports, trauma activation pagers and notification from team members.

Pre-Hospital Report

Every patient that EMS brings to the hospital, ground or air ambulance will have a pre-hospital patient report generated. Whether it is electronic or handwritten will be different from EMS department to department. From this report, all pre-hospital procedures, times, and vitals will be gleaned. The narrative portion of the report, where the scribe of the EMS providers notes their observations, may describe important patient injuries. Reviewing the EMS sheets daily may help the registrar determine possible trauma patients to be entered into the registry.

Other Reports

The operating report can provide information as to blood loss and also provide a detailed description of the injury. Autopsy reports can be obtained from the coroner to identify additional injury. Patients meeting pre-defined state criteria will automatically be sent to the coroner post mortem for review. The coroner will then perform an autopsy and note their findings, including cause of death, in a very detailed report. This is an excellent place to confirm injuries on trauma patients, which may not have been identified at the hospital. These reports, depending on the reporting county, are typically available by six weeks post-mortem..

Radiology reports are the findings and impressions from the radiologist for any imaging studies that the patient may have had during their visit. This is an excellent resource for finding very detailed descriptions of injuries. The radiologist will provide a description and/or sizing of injuries. It is important to note that a registrar must review the radiology report in its entirety. Doing so will create a clear picture of the injury, and the registrar will be able to collect important information that will help determine the appropriate ICD and Abbreviated Injury Scoring Scale (AIS) coding.

Lab results from the laboratory will be used to determine ethanol levels and drugs of abuse. Some registries will also use them to determine complications during a patient's hospital course. Pathology reports are helpful in determining tissue type injuries that are obtained from a surgical procedure.

Evaluation of Tools

Periodically tools utilized for trauma collection will need to be evaluated and updated. Software vendors will alert and provide the registrar with system updates including coding updates and NTDB updates. As research and PI issues change within the facility, data sets may also need to be changed. As data needs change within the region, state and national data repositories, the registrars at each specific facility will need to perform the necessary maintenance to the system for consistency.

Chapter 6

Data Integrity and Validation

Data validity

Data validity means that the data entered into the Trauma Registry is a true representation of what the trauma registrar has abstracted and is claiming to measure. Data reliability is a state that exists when data is complete and error free. Collecting accurate and useful data is the most important aspect of data validity. Keeping the database valid and free from errors by running edits on a monthly basis can be invaluable, especially when data is released as information to other sources.

Methods of Data Validation

Data validation occurs at the beginning when data is being collected that will be included in the database. Collecting data from the hospital medical record is a valid and reliable information source. Records may be obtained from multiple sources, such as emergency medical services (EMS) records, medical records from transferring hospitals, emergency room records, radiology reports, and operating room records. Please be aware that emergency room physicians will occasionally write a preliminary diagnosis such as "pneumothorax" or "ankle fracture". These are types of injuries that the physician is initially focusing on and will order more definitive tests to confirm the diagnosis. The Trauma Registrar is responsible for locating documented evidence of these injuries on radiologic reports before coding. To have valid data, the trauma registrar must record and code the diagnosis completely and accurately, using ICD

and AIS codes. Finally, in order to avoid mistakes made when transcribing information from the chart into the data base, you must take care to enter data accurately.

Software Validation

Most trauma data software programs have validation checks built into the system. This means that the software used by the trauma registry will automatically check some of the data fields for the registrar's accuracy and completeness. This measure protects some of the time and date fields. For example, it ensures that data entered as a patient's discharge date is not a date prior to the admission date and that EMS arrival times are not listed prior to the injury time. Some of the software validation checks are pre-built by the software vendor, and depending on the software, other edit checks can be built by the registrar. Data validation is of critical importance at multiple levels.

Logic Validation

Another type of data validation is logic validation. To check or proof the registrar's own work, a registrar must ask, " Does the data make sense?".   Key fields to check would be mechanism of injury against the trauma type. For example, gunshot wounds and stabbings should always be listed under penetrating injury, not blunt injury. Another example is if it is recorded that a patient arrived by private mode, but vitals are listed from a local EMS run sheet, then this would indicate that there is an error with one of these data points. Is the trauma registrar reporting a car accident as a mechanism of injury, but then using an E-Code for a fall? These types of validation can be performed by running specific reports for the facility on a regular basis. Again, running regular reports will help to keep data valid and clean of errors.

National Trauma Data Bank (NTDB)

The state and/or NTDB have a software validation check that occurs when data is downloaded to them. These state and/or NTDB required fields will be identified as an "edit", if the appropriate fields are not correctly completed. Running these edits and correcting them before submission allows the Trauma Registrar to submit valid data to local, state and national organizations.

Method and Inter-rater Reliability

Inter-rater reliability is a process to determine the accuracy of chart abstraction and data entry into the registry. This can be achieved by looking at several data points that are known for inaccuracy. These data points are typically objective data elements such as respiratory assistance, gender, and/or date of birth. The key is that not all data points need validation. For example, the patient's physical home address is typically not used in a hospital setting, and therefore does not demand validation. However, the patient's home location, either city or county, is used and thus is a consideration. Data elements consistently used for reporting purposes, injury prevention, research, and/or process improvement should routinely validated. To ensure maximum results, an alternate trained registrar will conduct the survey.

Another key area to validate include the elements, which compose the probability of survival (POS). These elements are age, blunt verses penetrating injury, revised trauma score (RTS), and injury severity score (ISS). The RTS is a calculation based on the patient's initial vital signs. This would include respiratory rate (breaths per minute), systolic blood pressure (mmHg), and the Glasgow Coma Score (GCS). The POS is a weighted formula, which calculates the individual hospital's M and Z statistic, which represents the hospital's trauma mortality and

morbidity. The POS is a nationally recognized score. The M and Z statistic allows the individual

hospital to compare their statistic to the national average to evaluate the care being delivered

internally.

These are but several of the necessary data points to validate. Other data elements to

consider but are not limited to are designated by (pre-hospital verses transfer hospital), trauma

system activation, intensive care days, hospital length of stays, etc. Data validation elements

should be discussed with the trauma coordinator or trauma program manager, and the trauma

director to ensure that all elements pivotal to their efforts are being covered. Once the data

elements are determined, the process becomes much simpler.

Process of Validation for Accuracy

The actual process for data validation ideally requires three individuals to perform the

exercise: the original abstractor, re-abstractor and an unbiased individual to compare the data.

The original person cannot re-abstract the determined data elements from the medical record for

data validation purposes. To perform an inter-rated reliability audit, determine the number of

fields to validate, and then re-abstract those elements. The next step is to compare the second

answer with the original abstracted information. To calculate the percent of accuracy use the

following formula.

(Number of elements agreed on) ÷ (number of elements validated) X 100

Example:

Hospital A will validate 50 data elements, upon their first data validation they found that both

data abstractors only agreed upon 30 of the data elements.

$30 \div 50 = 0.6 \ X \ 100 = 60\%$ accuracy

Each hospital needs to determine an acceptable accuracy percentage to strive for. Placing focus

and education on the data elements should increase the accuracy percentage each month. Data

entry is just as important as data abstraction. The same process previously described is used to

validate the elements that were originally entered into the trauma registry software.

Data Validation: A Simple Step to Great Success

The American College of Surgeons requires that each verified facility validate between

five and ten percent of the total registry volume (ACS, 1999). This is a more extensive method of

data validation and involves both the Trauma Registrar and the Trauma Program

Manager/Coordinator. The Trauma Program Manager/Coordinator determines how often the

validation of data occurs (monthly, quarterly, etc.). Once all data collection is completed, review

random charts for discrepancies in abstraction and data edits. Once areas of deficiency are

noted, discussion and review with the registrar are required to improve the quality of the data. If

the same error or discrepancy is apparent in a majority of the patient data points, reviewing the

charts more thoroughly will assist in correcting the identified issue.

Data collected in the Trauma Registry is a powerful tool. Hospital administrators utilize

the data to plan budgets and staffing needs. Data can demonstrate peak times of trauma events,

operating room usage. Researchers can use the data for benchmarking or trending. State

representatives can use the data to help implement or change state laws. Having valid data can

be a powerful instrument in proving data to make effective social change in each facility, region

or state. The most important information that the trauma data can provide is to improve patient

care for the facility.

Chapter 7

Complications

Definition and Identification

A complication is a disease, syndrome, condition, and/or event that can alter and/or hinder the treatment of the trauma patient (Mattox, 1994). It is important to note that collected conditions, related to the injury sustained, count as complications if contracted in the emergency room or occurred after admission to the hospital. These syndromes, diseases, and/or conditions will affect the patient's overall course in their attempt to heal from the trauma.

To identify complications review documentation by the treating physician's documentation. Diagnostic testing is responsible for a majority of the identification methods; however, depending upon the defined complications for registry collection, some of these may be more of a documented symptom. In either event, there needs to be documented evidence of the complication's existence after arrival. An example is a nursing home patient who presents with a pelvic fracture in the emergency department. In the course of patient's work up, a urinalysis (UA) revealed a urinary tract infection. This would not be a trauma complication. In the same patient, the UA was negative on admission but the patient had a positive UA five days later. This would be an example of a complication caused by either the care or in other cases the injury.

Location of Complications

Depending upon the hospital course of the patient, the registrar can find the complication documentation in a variety of places. Documentation of complications can be found recorded in the emergency department record, progress notes, consultations or discharge summary..

Complications/Deterioration

A number of sources, depending upon whom all the institution reports to, can determine

complications. If the facility reports to the National Trauma Data Bank (NTDB), a set of

complications is required for submission. The state and the region may also have a set of

required complications for submission, often mirroring each other. Furthermore, the facility itself

may have a set of complications. Examples of complications include: pneumonia, urinary tract

infection, pulmonary embolism, etc.

For further definition of the complications, it is advantageous to have a copy of the

national, state and/or regional data dictionary. This will provide further guidance to the exact

meaning of complication. Any further questions can be directed to the clinical staff in the trauma

department for clarification.

Chapter 8

Coding, Scoring, Scales

ICD-9 & ICD-10

ICD-9, and in the future, ICD-10, is an international coding system, created by the World

Health Organization, which uses certain numeric code combinations to represent diagnoses,

procedures, and events (World Health Assembly, 2011). Typically, a registrar will have an ICD-

9 coding book similar to the hospital coders and billers. There are also multiple online e-coding

resources. E coding, which is a series of numbers led by an "e", describes the injury event and/or

activity. Activity code is a new addition to the e-code system indicates the activity that caused or

contributed to an injury. The inclusive numbers are E000.0-E030, E-800-E999.1. The trauma

patient may have more than one e-code to describe their injury. An example would be a highway

worker falling five feet from a piece of equipment onto a road than is strike by a car; E-codes

would be 814.7 and 884.9.

The next pieces of ICD-9 are the diagnoses. It is at least a three digit code, and can

include a fourth and/or fifth digit, to represent a diagnosis. A trauma registrar will primarily

concern themselves with the inclusive codes between 800.00-995.85, which are all the injurious

diagnoses. Please check national, state or regional reporting criteria to know exactly which ICD-

9 diagnosis codes are included and excluded. The state may require additional codes outside of

the injurious diagnoses.

Lastly, are the procedure and intervention codes. These are three and four digit codes that

represent any procedures or interventions that may be used to treat the trauma patient's injuries.

Typically, only certain procedure codes are required by national, state or regional trauma

reporting systems; for example, any surgical procedures and immobilization techniques. Each

particular institution may have their own listing of procedures that they prefer to track for

process improvement. Every country that uses ICD coding has moved to ICD-10, except the

United States. The expected implementation date of ICD-10 for the US is October 1, 2013. ICD-

10 is more detailed in its classification. ICD-9 has approximately 13,600 codes whereas ICD-10

has approximately 69,000 (WHO, 2011).

Abbreviated Injury Scoring

Abbreviated Injury Scoring (AIS) was developed in 1969 to assign a numeric code to help

determine the severity of injuries sustained in a trauma (AAAM, 2005). The AIS is typically

built from the ICD9 code designated for the injury, and goes more in depth with the location and

degree of injury. This is an anatomical scoring system, rather than a physiological. In

conjunction with health care provider description, intervention or procedure description, a

registrar can use the AIS coding scale to define the severity of the injury further. Any code with

a .9 ending is a code that does not have a particular score, and is not included in the ISS. These

are vague codes to use when there is not enough information available to select a particular

injury and/or diagnosis code. AIS codes also include Organ Injury Scale numbers to allow for

confident injury scoring. It is important to familiarize oneself with the categorization of the AIS

injuries, as some injuries are not classified in the commonly assumed body region, (ex. drowning

is assigned to the chest whereas asphyxia is assigned to the head area). The AAAM (Association

for the Advancement of Automotive Medicine) provides training and scoring books for the AIS

system (AAAM, 2005).

Injury Severity Score

The Injury Severity Score (ISS) is the overall designation of the seriousness of the

injuries sustained. The range is from 1-75, 75 is potentially non-survivable. The higher the ISS

score, the lower the probability of survival. After determining the AIS components for a

patient's injuries, the registrar will then take the most acute injuries in three different body

areas, square the AIS numbers, and then compile them to determine the ISS (Injury Severity

Score) of a patient. The exception to this is any AIS code that ends with .9. These placeholder

codes do not tally into the final sum for ISS (AAAM, 2005).

Glasgow Coma Scale

The Glasgow Coma Scale (GCS) is a scoring system that determines the neurological

function of an injured patient, with results from three being the lowest and least responsive to

fifteen being alert and orientated (Wikipedia, 2011). There are both adult and a pediatric GCS

scales. There are three components in measuring the total GCS: eye opening (1-4); verbal

response (1-5); and motor response (1-6). The sum of these three categories results in the final

GCS total. If documentation only includes a total, individual GCS components cannot be

recorded. Only the totals of fifteen or three can be guesstimated at 4, 5, 6 or 1, 1, 1. The sum of

zero does not exist for GCS, therefore an unresponsive patient has a score of GCS of 3.

Table 1 Adult Coma Scale

	1	2	3	4	5	6
Eye	Does not open eyes	Opens eyes in response to painful stimuli	Opens eyes in response to voice	Opens eyes spontaneously	NA	NA
Verbal	Makes no sounds	Incomprehensible sounds	Utters inappropriate words	Confused, disoriented	Oriented, converses normally	NA
Motor	Makes no movements	Extension to painful stimuli (decerebrate	Abnormal flexion to painful stimuli	Flexion / Withdrawal to painful stimuli	Localizes painful stimuli	Obeys commands

		response)	(decorticate response)	(decerebrate response)		

Glasgow Coma Scale: www.emsresponder.com

Table 2 Pediatric Coma Scale

	1	2	3	4	5	6
Eyes	Does not open eyes	Opens eyes in response to painful stimuli	Opens eyes in response to speech	Opens eyes spontaneously	N/A	N/A
Verbal	No verbal response	Inconsolable, agitated	Inconsistently inconsolable, moaning	Cries but consolable, inappropriate interactions	Smiles, orients to sounds, follows objects, interacts	N/A
Motor	No motor response	Extension to pain (decerebrate response)	Abnormal flexion to pain for an infant (decorticate response)	Infant withdraws from pain	Infant withdraws from touch	Infant moves spontaneously

*Glasgow Coma Scale: www.*http:/ /en.wikipedia.org/wiki/Paediatric_Glasgow_Coma_Scale

Revised Trauma Score

To determine the Revised Trauma Score (RTS), three different vital signs components are used: GCS, Systolic Blood Pressure, and Respiratory Rate. The RTS is used, primarily, in two different places. The first is pre-hospital Emergency Medical Services (EMS) assessment to determine the best level of health care center to transport the patient. The other is mainly used by the hospital to determine outcome prediction. Any patient with a score < 4 should be taken to a trauma center (Pohlman, Bjerke, & Offner, 2010).

Table 2

Example of the Revised Trauma Score			
Glasgow Coma Scale	Systolic Blood Pressure	Respiratory Rate	Coded Value
13-15	>89	10-29	4
9-12	76-89	>29	3
6-8	50-75	6-9	2
4-5	1-49	1-5	1
3	0	0	0

Revised Trauma Score: www.trauma.org

Trauma and Injury Severity Score (TRISS)

TRISS is a scoring system that determines the probability of survival. To determine this, an algorithm using both the RTS and ISS is used.

TRISS calculators can be found in trauma software and online through such websites as www.Trauma.org.

Z and M Statistics

The Z- statistic quantifies the difference in the actual number of deaths (or survivors) in the test subset and the predicted number of deaths (or survivors) based on the baseline. The M-statistic is an injury severity match of the populations under comparison (Boyd, Tolson, & Copes, 1987).

Organ Injury Scale

The Organ Injury Scale (OIS) is a grading system, developed in 1987 by the American Association for the Surgery of Trauma, which determines the level of injury to bodily organs.

More than likely, a registrar will only focus on the grading of solid organ injuries. It is a universal language used by both radiologists and surgeons to determine severity of injury. The number given, which can vary between I and VI with I being least severe correlates directly to a corresponding AIS designation for organ injury (Tinkoff et al., 2008).

Functional Independence Measure FIM©

FIM© is a rehabilitation based scoring system that determines the starting point, continuing program, and ending results from a rehabilitation standpoint. Measurement of scoring takes place in the rehabilitation or skilled nursing facility, as it is a long-term measurement related to the functional status post the cease of the acute care side. This way, rehabilitation professionals can adjust their goal outcomes and expectations for the trauma patient (Uniform Data System for Medical Rehabilitation, 1999).

WeeFIM©

FIM© system used for infants, children, and adolescents with a disability, either congenital or acquired. There are 18 variables that are measured to determine need and assistance rendered. The WeeFIM© system can be used in any setting, inpatient or outpatient (Uniform Data System for Medical Rehabilitation, 1999).

Functional Outcome Measure

This is a scoring system used to determine an expected outcome. It is another system that is scored and determined by a member of a Physical Medicine and Rehabilitation team. This scoring system is more often seen in research.

Rule of 9's

[RULE OF 9'S]

ANTERIOR   INFANT   POSTERIOR

PALMAR METHOD
(Patient's palm)   1%
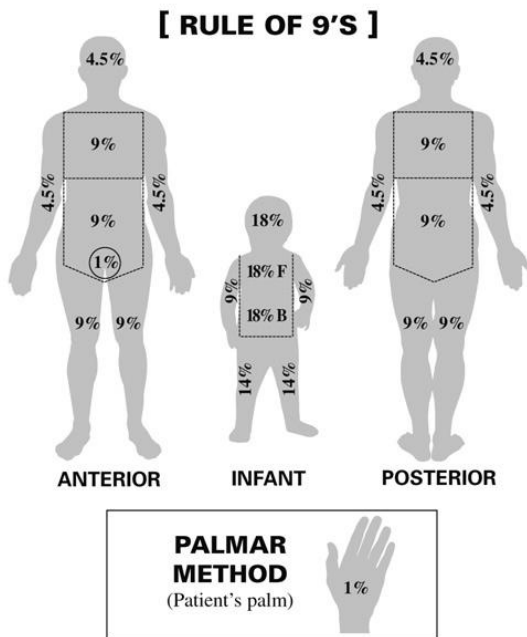
In an effort to have a uniformed measuring system for the amount of body surface area affected in a burn injury, given the disparity between body mass in the populace, the Rule of 9's grading scale was developed. The human body is divided up into eleven sections. By assigning each section a number related to 9, as each section was guaranteed to be covered by about 9% of flesh, a grand sum of Total Body Surface Area (TBSA) affected is able to be reached, with the severity of degree of burn measured in another method. This way, regardless of an individual's size, an estimate of the burned damage can be reached. There is a different rule set for adults versus pediatrics. The Rule of 9's is only applied when the degree of burn is at least 2nd degree, and is designated more for field triage than inside a sophisticated burn center (Oliver, 2009).

Rule of 9's: http://www.njburncenter.com/ruleof9s_lg.html

Chapter 9

Data Requests and Reporting

Collaboration

There will be times that the registrar will be asked to participate in a joint research project. This may be with other institutions, state, local, national registries or researchers. Collaboration with others and establishment of data facilitates evidence-based care, as well as provides data to be researched with the end goal of improving patient's outcomes and development of prevention programs (ACS, 2006).

A few registry related items that require collaboration or a repository of data include:

- Grant funds often require joint data collection

- Researchers/grants from within your own institution may require collaboration of data collection

- Injury Prevention studies

- Public Health Surveillance

Utilizing repositories of data such as National Trauma Data Bank or state registries can be very helpful when a study requires a large number of patients, which are not available within a single institution's registry/database. A study could include looking at different regions, age groups, or other factors not found at one institution.

Participating in a joint research project, running reports for a survey, using data to support ideas, providing information on a state, local or national level are all forms of collaboration. It is important to remember that all data released must comply with the Health Insurance Portability and Accountability Act (HIPAA) policies and guidelines. Clearance for

release of data may need to be obtained from the Internal Review Board (IRB). Most institutions

promote research and collaboration with others to promote the exchange of information.

Representation of Data

An Excel chart serves as a graphic or visual representation of data in your registry. There

are four types of charts that a registrar may routinely use in representing data in reports.

Column Chart

A column chart uses vertical bars of differing heights to illustrate the relationships

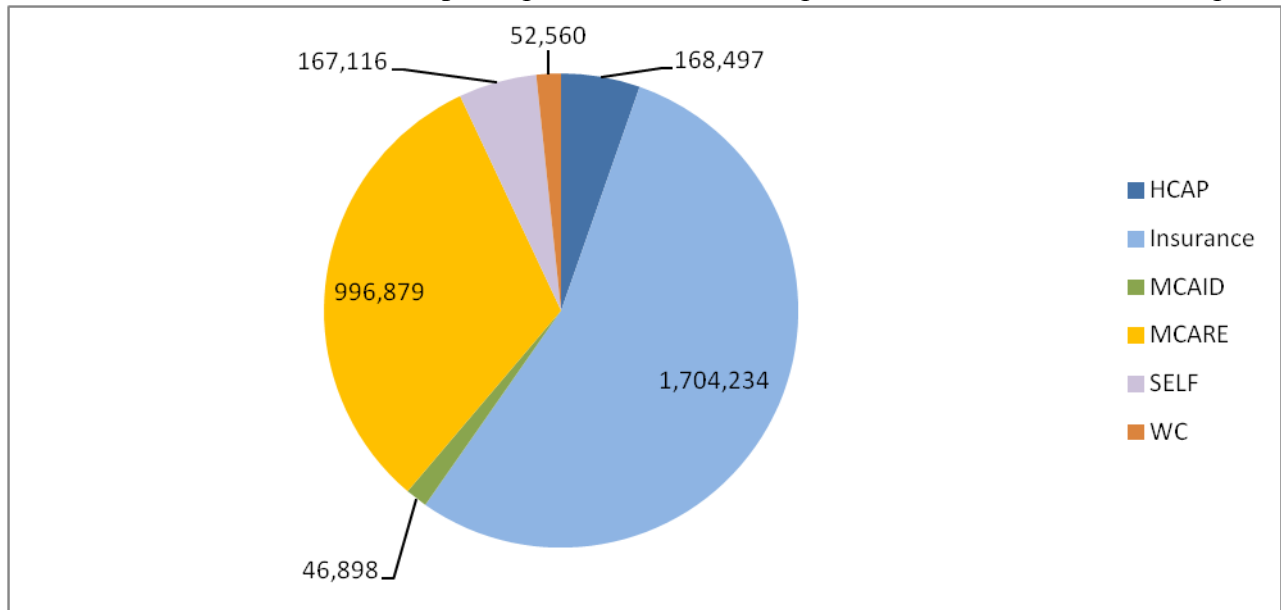between groups of data. It is useful for showing trends over time.
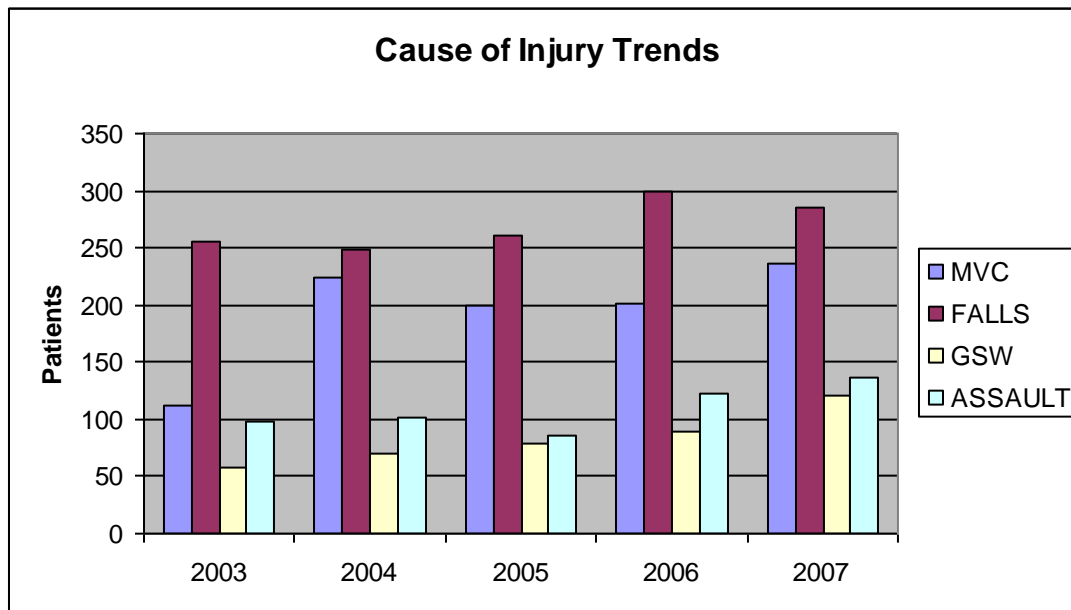
Line Chart

A line chart is similar to a column chart for showing trends over time; however, it uses

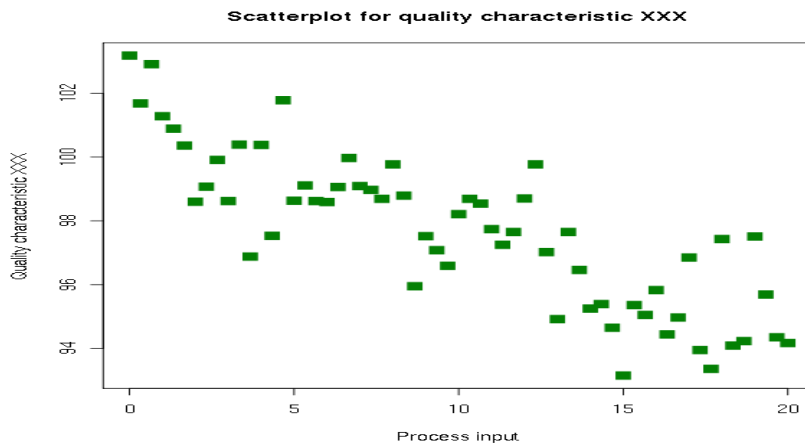lines, instead of bars, to connect a series of data points.

Cause of Injury Trends
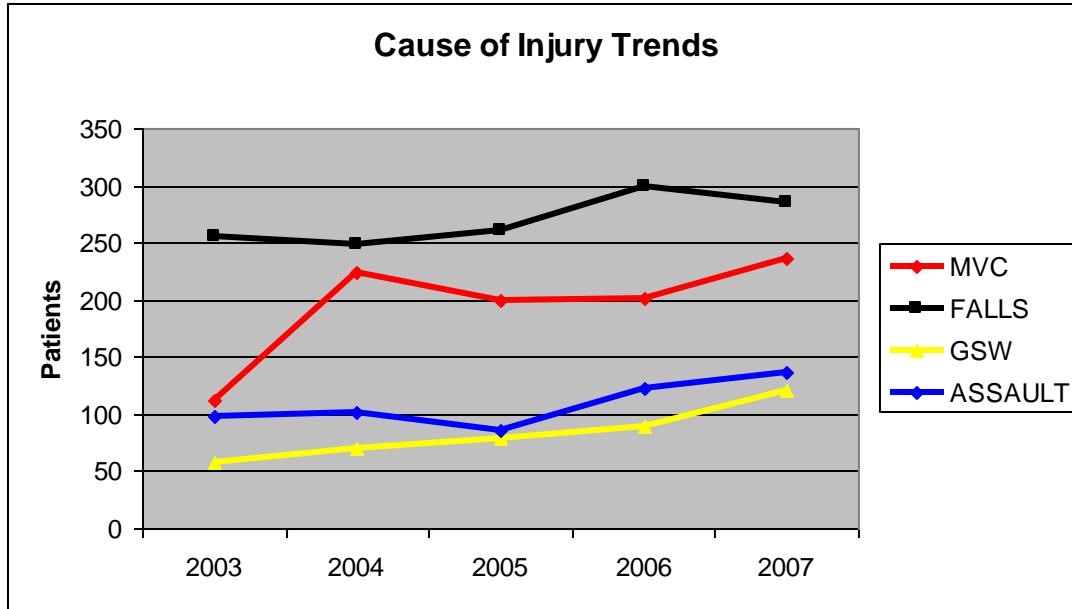
Pie Chart

A Pie chart shows the relationship of a part to a whole. Each part is shown as a "slice" of the pie.

Scatter Chart

A scatter chart, or XY chart, shows the relationship between two categories of data. One category is represented on the vertical (Y) axis and the other category is represented on the horizontal (X) axis. The points in the chart are not connected with a line, since the two categories do not relate to one another (Microsoft, 2009).

Statistical Presentation of Data

Many times data is reported out as a mean, mode, ratio or median. Presentation of data is a method to report data about a population, occurrence or outcomes. Below is an example of them.

<div align="center">

Mean

</div>

The mean (or average) of a set of data values is the sum all of the data values divided by the number of data values.

Sum of all data values/ number of data values = mean

Ex. 10+15+20+18+12+17 / 6 = 15.3

Median

The median of a set of data values is the middle value of the data set when it has been arranged in ascending order. That is, from the smallest value to the highest value.

Ex. The ages of nine trauma patients with a stabbing injury last week are listed below

   17   20   27   32   18   39   36   14   25

Find the median of this set of data values.

Solution:

Arrange the data values in order from the lowest value to the highest value:

   14   17   18   20   27   25   32   36   39

The fifth data value, 27, is the middle value in this arrangement, making the median 27.

Chapter 10

Performance Improvement

Performance Improvement (PI) is the concept of measuring the output as of particular process or procedure, then modifying the process or procedure to increase the output, increase efficiency, or increase effectiveness of process or procedure (ACS, 2006). Trauma PI is essential the monitoring and improvement of care. The major objective of PI is to reduce inappropriate variations of care by measuring and improving the process of care and outcomes. Reliable data collection is a key component in supporting an effective PI program.

 As you familiarize yourself with the PI program already at the facility or in the process of being developed, keep the following in mind:

1. No two programs are the same.

2. The trauma medical director must lead the PI.

3. Adverse outcomes do not always indicate a bad program, instead look at how the information is handled. Adverse outcomes should guide the program to evaluate and change current policies, procedures and suggest the thought" Is there a better way?"

4. Trauma PI should be integrated within the hospital PI program.

5. Loop closure is a required outcome for the PI process.

The registrar is an integral part of the PI process since the registrar is gathering and reporting the data. The registrar may be the first person to recognize an issue or see a trend in the data.

Developing a PI program

A well-established program may have audit filters already in place. If not, plan a meeting with the trauma medical director and program manager to discuss the filters required to track data. Filters are usually tracked monthly, and reported (either monthly or quarterly) until a desired outcome is achieved. Once a filter has reached the desired outcome, it most likely will continue to be tracked for a few months to be sure the desired outcome is maintained. Once a filter is dropped, it is usually placed on a schedule to be periodically rechecked.

The following example is a simple PI project. The registrar has noticed that there is an increase in the number of charts missing the first GCS. The registrar runs a report from the last few months to confirm his/her suspicions. Data shows that for the last three months, GCS is missing on 35% of the charts. The information is shared with the trauma program manager. An educational program is designed and implemented for the nurses. The registrar will then set up a filter to run the data each month until the desired outcome is met. The data is reported during the trauma PI meeting. After several months of an acceptable outcome (95% or better), the committee may elect to drop the filter from regular reporting and ask it be reported every six months. Depending on the PI issues being monitored, a registrar may have several audit filters each month to report on.

Examples of PI filters

a. Trauma surgeon response time for trauma resuscitation

b. Attendance of surgeons at monthly PI meetings

c. Mortality, morbidity and complications

d. Time to CT scanner

e. Delay in diagnosis or missed diagnosis

f. EMS Scene time

g. Length of stay in the emergency room

h. Over/Under Triage

Chapter 11

Reviews and Verification

Designating Bodies

Each state affiliation guides the designating body that is responsible for a facility's

trauma verification status. Many states defer the process to the American College of Surgeons

(ACS). There may be state foundations, health departments or another designating body that is

utilized in place of the ACS. It is important to be aware of the trauma governing bodies and

laws that are in place to guide the trauma verification process. The information in this section is

based on an ACS visit. If a facility is verified from another entity, please review their website

for information pertaining to a non- ACS visit.

If a state is verified by the ACS, become familiar with the "Resources for Optimal Care

of the Injured Patient, 2006". This resource document can be purchased through the ACS

website. Other documents related to trauma care and the verification process can be found on

their website. If a state is verified by another designating body, reference their office and web

page for guidance.

Prior Verification Report

Depending on the verification body, reports will need to be submitted four to eight weeks

prior to the verification date. The following are a few examples of the report names that may be

required:

1. ACS Application Submission

2. Pre-Review Questionnaire (PRQ) – American College of Surgeons

The PRQ are a set of questions developed by the ACS to elicit a comprehensive description of a trauma program. The answers represent the framework of the trauma program, which guide that the reviewers during the facility's consultation or verification visit. The registrar's role in preparing the document is to provide the required statistical and registry data from patients in a pre-determined 12 month period. Consistency of data, processes and care are the keys to a successful visit.

The Trauma Center Verification Process

A hospital may elect to become a verified trauma center. Hospitals completing the process for the first time or who have gone through major leadership changes since the last visit may have a consultation visit. The consultation visit is much like the verification visit and identifies any weaknesses or deficiencies that must be corrected prior to a verification visit. In either the consultation or verification visit, the PRQ is completed and sent to the ACS. Dates are set for the visit. Prior to the visit, this can be a stressful time, but with organization, clear-reasonable timelines, and clearly defined roles, the program can be successful. It takes a team to develop a trauma program. Successfully verified trauma centers will continue the verification process every 3 years. During each sequential visit, the reviewers will be looking for continuous growth of the program.

The team of reviewers for a verification visit consists of two trauma surgeons; one will be from the same level trauma center as level being reviewed. In some cases, a nurse reviewer or another surgeon from Neurosurgery or Orthopedics may attend as well.

The reviewers start the first day with chart review. The registrar may have the responsibility of sitting with a reviewer to assist with navigation through a hard copy or

electronic chart. The reviewers typically ask the registrar to run a few reports to test the ability

to retrieve data from the trauma data software program, determine his/her understanding of

communication and/or obtain additional information to a particular topic/issue identified during

the chart review. The first day will also consist of a pre-review dinner. The reviewers will go

through the PRQ with the surgeons, administrators and other pertinent services i.e. radiology,

disaster coordinator, EMS, etc. The trauma registrar may be invited to attend.

The next day will include a tour of the facility, completion of the chart review, evaluation

of the PI process, and final assessment of the overall status of the trauma program. This is the

typical format, but can be changed per reviewer discretion. There is an exit interview to

disclose the reviewers' preliminary findings. The reviewers then prepare their findings which

are presented to the Verification Review Committee (VRC) of the ACS who make the final

determination of trauma center status. A letter of determination with supporting documentation

is then sent back to the facility within six to ten weeks.

Chapter 12

Education & Credentialing

Qualifications

Currently, there are no "set" criteria for trauma registrars. What is desirable is a previous medical background of some kind, proficiency with Microsoft Office® programs especially Excel®, data entry skills, medical terminology and anatomy proficiency. Some trauma programs prefer registrars with a medical coding background, as coding is a required part of the job. Other programs, require a Certified Specialist in Trauma Registry (CSTR) certification or a Certified Abbreviated Injury Scoring Specialist (CAISS) at some point during employment. Examples of common credentials amongst trauma registrars include, but are certainly not limited to: EMT, RHIT, RHIA, RN, CSTR, CAISS. Registrars may have regular interaction with medical staff, making interpersonal and networking skills mandatory.

Registry Training Class

The American Trauma Society (ATS) is the only organization to offer a complete Trauma Registrar Course recognized by the ACS as an avenue for comprehensive trauma registry training. This course combines basic and advanced registrar levels. It is a good starting point for new registrars to learn the basics of the job. Further skills will be acquired at the registrar's own facility and through continuing education offerings. The Registrar course is offered at least twice throughout the year. Registration information is available through the ATS website (www.amtrauma.org).

In addition, vendor specific software that the registrar uses will offer a yearly training conference, for both novice and experienced users. Check with your specific vendor for details.

Certification

Certified Specialist in Trauma Registry

The CSTR certification is offered through the American Trauma Society (www.amtrauma.org). Certification focuses specifically on the registrar and indicates formal recognition of basic trauma registry knowledge. This certification is highly valued and eligibility requirements include a minimum of 2 years full time experience in the trauma registry practice and successful completion of the certification. The comprehensive examination is offered through multiple regional testing centers as an online test.

CAISS

The CAISS, or Certified Abbreviated Injury Scoring Specialist, certification verifies the trauma registrar in Abbreviated Injury Scoring. The examination is administered through the Professional Testing Corporation (www.ptcny.com) at various locations through the United States. The requirements to sit for the test include registration and a fee. Typically a registrar has attended one or more classes offered by the AAAM on AIS scoring. More information is available on AIS through the Association for the Advancement of Automotive Medicine website (www.aaam.org).

Chapter 13

Resources

There are many resources available, both in hard copy and online, to help the registrar process quality data. It is recommended that the registrar equip his/herself with an arsenal of readily available materials. The following is a list to get you started!

Websites

a.   Alliance of Ohio Trauma Registrars: www.ohiotraumaregistrars.org

b.   American College of Surgeons: www.facs.org

c.   Association for the Advancement of Automotive Medicine Website: www.carcrash.org

d.   American Association for Surgery of Trauma (AAST): www.aast.org/traumaresources.html

e.   Health Resources and Services Administration: www.hrsa.gov

f.   UK based Orthopedic Education Resource: www.orthoteers.co.uk

g.   Trauma databank with useful clinical and radiological images: www.trauma.org

h.   Injury Prevention Website: www.injurycontrol.com

i.   The American Association for the Surgery of Trauma: www.aast.org

j.   Ohio Department of Public Safety: http://www.ohiopublicsafety.com

k.   USPS Zip Code Finder: www.usps.com

l.   The Center for Disease Control and Prevention: www.cdc.gov

m. Injury Prevention Website: www.injurypreventionweb.org

n.   National Highway Traffic Safety Administration: www.nhtsa.dot.gov

o.   American Trauma Society: www.amtrauma.org

p.   NTDS: www.ntdbdatacenter.com

q.   Yahoo Registry Club: http://groups.yahoo.com

r.   ICD9 online coding sites:
    1.   Flash Code: www.icd9coding1.com/flashcode/home.jsp
    2.   Chris Endres: http://icd9cm.chrisendres.com/
    3.   Online ICD-9-CM coding reference & lookup Website :
         www.icd9coding.com

s.   American Health Information Management Assoc: www.ahima.org

t.   Society of Trauma Nurses: www.traumanurses.org

u.   Anatomy:
    1.   Wheeless Textbook of Orthopaedics: www.wheelessonline.com
    2.   Gray's Anatomy: www.bartleby.com/107/
    3.   Inner Body: www.innerbody.net
    4.   3-D interactive tool of the human body: www.visiblehuman.epfl.ch

v.   Conversion Sites:
    1.   www.calculateme.com
    2.   www.onlineconversion.com
    3.   www.trauma.org/archive/scores/triss.html
    4.   www.convert-me.com

Hard Print Materials

a. Medical Dictionary- to assist with unfamiliar medical terminology and any

eponymous diagnostic terms that may be used by the physician.

b. *Abbreviated Injury Scale Coding Dictionary*- published by the Association for the

Advancement of Automotive Medicine, available through one of their training classes

or through order online. The AIS dictionary has a listing of specific injurious

diagnosis which correlates to a numeric code that then determines an Injury Severity

Score.

c. ICD-9 CM Coding Books- consist of three volumes, which are utilized in the

trauma registry. The first volume is the table of contents. The second volume includes

all diagnosis codes, though registrars tend need the injury section of the coding book,

typically from code 800.00 to 959.9. Depending on state reporting requirements, there

may be some additional ICD9 codes from earlier in the book (ex. Pneumocephalus,

cerebral edema). E-codes and procedures codes are also obtained from in second

volume. The third volume contains the codes for procedures. ICD-9 is updated

annually in October.

d. Anatomy Books- *Grey's Anatomy* is one example. Many hospital libraries may

have this one or a current version. Anatomy books can found purchased online or

locally at a collegiate bookstore or medical supply store.

e. Software Vendor- trauma registry application will also have many resources to

help. Some of these will be in the form of a manual, hard print or electronic,

telephone support. The vendor will have support staff on hand to assist with

programming, reporting, data entry, exporting or updates.

f. *Resources for the Optimal Care of the Injured Patient* - American College of
Surgeons

g. Data Dictionaries – State, local, regional, and hospital

Peer Support

a. Regional committees**:** Many hospitals are affiliated with a regional trauma

system, which may have a subcommittee of registrars that meet monthly or

quarterly to discuss coding and data entry concerns, and for educational

conferences.

b. State committee: Many states have a formal trauma registry meeting. These

committees offer experience and camaraderie as a resource for the new registrar. By

joining these types of committees, the registrar can network and find assistance.

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Appendix

Trauma Registry Data Request Form

ALL requests for data must have this form completed

| Trauma Registry Data Request Form |

Date Received: _____

Date Request Initiated: _____/_____/_____   Request Due Date: _____/_____/_____
(Due to the volume of requests, a minimum of 1-week is required)
Trauma Staff Receiving Request: _____

Requestor: _____   Department/Affiliation:
_____

Phone Number: _____ Pager: _____   Email: _____

Define Reason For Data Request:
_____

_____

_____

_____

_____

Will the data be used in publication(s)?   ☐ Yes ☐ No
    If YES, please list: _____

Will the data be used in research?   ☐ Yes ☐ No
    If YES, you must list the IRB approval number: _____

The Trauma Registry will receive written credit within any/all publications utilizing information within the database.   _____ ***Initials***
Final Format: ☐ Detail Report (Giving individual patient information in columns/rows – no calculations)
          ☐ Crosstab Report (Calculations, averages, outcome measures, comparisons, percentages, etc.)
                ☐ Excel Spreadsheet
                ☐ Excel Spreadsheet with graphs
                ☐ Graphs only

Output: ☐ Paper
                                 ☐ Email
                                 ☐ Diskette (Requestor must supply the diskettes)

*Confidentiality Notice: **This form and any attachments, is for the sole use of the intended recipient(s) and may contain confidential and privileged information. The recipient is responsible for maintaining the confidentiality of this information and is to use the information ONLY for the authorized purposes pursuant to hospital confidentiality and HIPAA policies.***

I hereby agree to the above statements.

_____
(Signature)

_____
(Printed Name)

_____/_____/_____
(Date)

Please place a check mark next to the data element applicable to your request. The Trauma Registry personnel will go over this list with you to clarify your request.

DATA ELEMENT	DATA ELEMENT
☐☐ Tracking Number (Unique Trauma Registry Number)	☐ Trauma Surgeon Arrival Time
☐ Medical Record Number	☐ Trauma Surgeon Arrival Date
☐ Patient Account Number	☐ ICD-9-CM Codes (Injury only or ALL codes)
☐ Patient Name	☐ AIS Body Region
☐ County of Residence	☐ AIS Code
☐ City of Residence	☐ ISS
☐ State of Residence	☐ ETOH Level
☐ Zip Code of Residence	☐ Toxicology (Amphetamine, Benzodiazepine, Cannabis, Cocaine, Opiate, PCP)
☐ Race	☐ In-house Procedures
☐ Gender	☐ Operative Procedures (Craniotomy, Exploratory Laparotomy, ORIF, STSG, OTHER:
☐ Date of Birth	
☐ Age	_____
☐ Cause of Injury	☐ Procedure ICD-9
☐ Cause E-Code	☐ Vent Days
☐ Injury Time	☐ Payment Source (Medicaid, Medicare, Prison, Private Insurance, Self-Pay, Workman's Compensation)
☐ Injury Date	
☐ Injury Location Code	☐ Discharge Disposition (Home, Jail, Nursing Home, Rehab Hospital, Morgue)
☐ County of Injury	

☐ Protective Devices (Airbag, Safety Belt, Helmet, etc.) ☐ Trauma Type (Blunt, Penetrating, Thermal, Asphyxia ☐ Trauma Alert Category (1, 2, Not Called) ☐ Work Related (Yes, No) ☐ Transport Mode (AS, AR, HS, HR, POV, Walk) ☐ <u>Transport Agency Scene</u> ☐ <u>Transport Agency Referring Hospital</u> ☐ Scene Initial Vitals (B/P, Pulse, Resp, GCS) ☐ Scene Procedures (Intubation, Immobilization, CPR, Cric, Fluids) ☐ Referring Facility ☐ <u>Referring Facility Arrival Time</u> ☐ <u>Referring Facility Arrival Date</u> ☐ Referring Facility Initial Vitals (B/P, Pulse, Resp, GCS) ☐ Referring Facility Procedures (Intubation, Immobilization, CPR, Cric, Fluids, HeadCT, AbdCT, ChestCT, CT, Ultrasound, Chest Tube, DPL) ☐ Admitting Service _____ ☐ Admitting MD _____ ☐ Admit Type (Emergency, Direct) ☐ ED MD _____ ☐ <u>ED Arrival Time</u> ☐ <u>ED Arrival Date</u> ☐ ED Initial Vitals (B/P, Pulse, Resp, GCS) ☐ ED Procedures (Intubation, Immobilization, CPR, Cric, Fluids, HeadCT, AbdCT, ChestCT, CT, Ultrasound, Chest Tube, DPL, Sutures)	☐ <u>Discharge/Death Time</u> ☐ <u>Discharge/Death Date</u> ☐ Outcome (Alive/Dead) ☐ Length of Stay ☐ Revised Trauma Score ED ☐ GCS Total ED ☐ Revised Probability of Survival ED ☐ Place of Death ☐ <u>Organ Donation</u> ☐ <u>Complications</u> ☐ Other – <u>Please define below</u>: _____ _____ _____ _____ _____ _____

Elements that are underlined are components of the HIPAA defined Protected Health Information (PHI) and may NOT be provided for use outside of the facility. Re-identification, which constitutes the assignment of a random code to each individual may be used to allow traceability of the data as long as the code key is kept securely by the investigator and the

identity of the study subjects is not disclosed to the user(s) of the data. The code may NOT be derived from information about the individual and may NOT be otherwise capable of being translated so as to identify the individual.

For Office Use Only:

Lists/Queries:
_____

Reports:
_____

Communication/Clarification:
_____

_____
_____

Trauma Program Manager Approval: ☐ _____   Request Denied: ☐

Trauma Medical Director Approval: ☐ _____   Reason:

Job Description

Those responsible for the identification, collection, analysis and reporting of trauma carry several titles, have a varied level of background and educational expectations. This chapter hopes to provide a few example job descriptions which are currently in place within the United States. The hospital-specific identifiers have been removed as well as salary/hourly rates of pay.

I. Trauma Registrar

Required Skills/Work Experience

Demonstrates excellent verbal, written and interpersonal communication skills. Demonstrates experience in using Microsoft Access, Word, Excel and Power Point. In-depth knowledge of medical terminology, anatomy, medical records procedures, ICD-9-CM coding, and Abbreviated Injury Scale (AIS) assignment. Demonstrate an independent work initiative, sound judgment, diplomacy and professional demeanor. Must be detail-oriented and goal-oriented with the ability to work independently all awhile meeting deadlines.

Recommended Credentials, Licensure or Certification

Associate Degree in Health Information Management, Registered Health Information Technician (RHIT/RHIA) and Certified Specialist in Trauma Registry (CSTR), Certified Abbreviated Injury Scoring Specialist (CAISS), preferred. EMT certification or a registered nurse.

Responsibilities

1) Develop, design, implement and maintain computer-based systems for trauma injury data.
2) System administrator for the trauma registry database, install and update software.
3) Provides first-level computer support within the trauma department.
4) Responsible for case identification, data abstraction, ICD-9-CM coding, input, retrieval, analysis and validation of trauma data.
5) Assigns AIS based on knowledge of rules established by the American Association for the Advancement of Automotive Medicine (AAAM).
6) Sets standards for data entry, implementation of procedures, writes/develops manuals for all registry-related functions.
7) Creates and implements exports of registry data consistent with data requests and compliance with national, state or regional repositories.
8) Participates in injury-related research studies.
9) Statistical analysis of data for reporting, performance improvement as well as continual preparation and maintenance of trauma verification status.
10) Develop training objectives and other written materials for registry-related presentations.
11) Represent the healthcare system at various local, state and national registry meetings.
12) Responsible for data quality of all variables required and reported to the state and national repositories.

13) Maintains collaborative relationship with the trauma registry vendor to ensure current technology in data collection.
14) Obtain trauma patient autopsy reports from the coroner and enter data into registry.
15) Assists in the interviewing and training of new registry personnel.
16) Assists and participates in the planning and implementation of injury prevention activities.
17) Respects patient rights for informed consent and the handling of confidential information as defined by the healthcare system's mission and applicable state/federal laws and regulations.
18) Review timeliness, accuracy, availability and security of information.

Minimum Knowledge, Skills and abilities may include:

1) Knowledge of medical records procedures to obtain patient information.
2) Ability to type in order to enter data into the computerized database.
3) Interpersonal skills necessary in order to communicate, understand, interact and respond effectively with all levels of hospital and medical staff, patients and outside agency personnel when gathering and exchanging medical information.
4) Ability to read and write in order to understand and follow written instructions, analytical skills and knowledge of medical terminology and anatomy necessary to interpret, evaluate and classify medical record information.
5) Ability to concentrate and pay close attention to detail (up to 90% of working hours) for performing trauma data analysis.

HOW MUCH TIME WOULD A REGISTRAR TAKE
IF A REGISTRAR DID HAVE TIME"

Written by: Karen Phillips, BS, CTR

"I do my best to provide all the necessary resources to meet the requirements of the state central registry, to maintain my American College of Surgeons (ACS) approval and to provide quality information to hospital staff. But despite all that I do, my registry frequently falls behind in abstracting and follow-up. What am I doing wrong?"

The Challenge

Regardless of the size of the registry, the expertise of the registrars or how well they are supported by their employers, registrars are typically faced with the need to process and follow more and more cases in less and less time, while still maintaining or increasing data quality and providing comprehensive reporting services.

Time: The Bad News

Although falling cancer rates should signal a decrease in the number of reported cancer cases, greater population density and age are expected to contribute to a nearly 40 percent increase in new cancer cases over the next 20 years. But don't count on additional registry staff to handle the increased caseload. Because cancer registries do not generate revenue, registry costs must be absorbed by other parts of the cancer program – meaning registrars will likely continue doing more with less.

Time: The Good News

Time may also be on our side.

- Registrars can expect faster, less expensive computers.
- The Internet is becoming increasingly helpful, particularly with improving follow-up rates.
- For case finding and follow-up, registrars can expect electronic interfaces to other databases to be cheaper, more efficient and more widely available.
- Electronic data management continues to become more efficient as standard-setting agencies, such as the American College of Surgeons Commission on Cancer (CoC), the National Cancer Institute SEER Program, the National Program for Cancer Registries (NPCR) at the Centers for Disease Control and Prevention (CDC), and the North

American Association of Central Cancer Registries (NAACCR), continue to increase the standardization of data items, codes and record layouts.

Cancer Registry Goals and Responsibilities

Unfortunately, it is not unusual for the administrative staff of health care facilities to be completely in the dark about the purpose of cancer registry, the responsibilities of the registry staff and the associated costs. The fundamental goals of a cancer registry are to help clinicians understand the causes of cancer and what cures it. State and other central registries accumulate baseline data so that increases or decreases in cancer incidence can be identified and studied to reveal possible causes. Hospital-based registries monitor the outcome of cancer care to help determine if one treatment is more effective than another for a given type and extent of cancer. To accomplish these goals, the hospital-based registrar typically has six areas of responsibility:

- Case Finding: Identifying the cases that need to be abstracted and followed.
- Abstracting: Collecting and properly coding a minimum of 100 data elements usually more.
- Follow-up: Determining at minimum the vital status of each registered case at least once a year.
- Administrative Responsibilities: Meeting other requirements of the hospital and regulatory agencies.
- Data Quality Control: Ensuring quality as mandated by standard setting organizations.
- Data Analysis and Reporting: Scrutinizing and sharing data.

Rules for Staffing

Standard-setting agencies do not make hard and fast staffing recommendations. They prefer to leave each institution free to meet mandatory requirements in their own way. While this is a laudatory position, registry supervisors are left with little guidance in setting salary expectations, staffing levels and performance expectations.

Here are some "rules of thumb" to help you manage your registry. Typically, one full-time registrar can be expected to manage a registry that accessions 400 cases per year. In registries where 500 or more cases per year are managed by each registrar, one will consume a disproportionate amount of resources. Little time is left to devote to equally important responsibilities such as quality control and report generation. Therefore, the following estimates are based on a registry employing one full-time certified registrar who accessions 400 new cancer cases per year. Please note that these rules and estimates are not "official." They simply represent the informal agreement of many veteran registrars. Considerable variation among facilities is assumed.

Case Finding

Case finding is the most frequently ignored category of responsibilities when estimating time requirements in a registry. It includes monitoring admissions, discharges, pathology reports, clinics and outpatient sources. Case finding involves considerable time in reviewing charts that ultimately do not meet the criteria for inclusion in the registry. It may include ancillary duties such as adding AJCC staging forms to the chart and identifying cases for cancer conference. Case finding efficiency can be greatly enhanced through the use of efficient electronic interfaces among databases. Time estimate: 10 percent to 20 percent (Four to six hours per week in a registry accessioning 400 new cases annually.)

Abstracting

The time required to abstract a single case can vary greatly, depending on the complexity of the case, quality and completeness of the chart, the experience of the registrar, the number of required data items and the amount of required text. A generally agreed time range is 20 minutes to 80 minutes per abstract with a goal of averaging 30 minutes to 40 minutes per case. An experienced registrar, who does nothing but abstract data from the chart and has no other distractions or responsibilities, can usually complete more than 10 charts per day. Time estimate: 25 percent (Two cases per day at one case per hour.)

Follow-up

Updating the abstract at least once a year for every living patient in the registry can become a daunting and time-consuming task. It involves letters, phone calls, screening admissions, pathology reports, clinics and outpatient sources, as well as monitoring local obituary columns and other non-traditional methods. The Internet is a boon to registrars for finding patients who have changed their names or moved. It is generally agreed that the registry's follow-up burden grows each year until 8 to 10 years have passed. At that point, the numbers of patients who expire are approximately equal to the number added to the registry each year. Time estimate: 25 percent (10 hours per week.)

Administrative Responsibilities

Typically, registrars are expected to coordinate all hospital-based efforts to meet CoC requirements for approval. This can include support for cancer committee meetings, cancer conferences, publishing the annual report, drafting a cancer program policy and procedure manual and many others. Additional hospital cancer program responsibilities may be involved. For example, screening activities, meeting abstracted cases. Time estimate 10 percent to 15 percent (Four to six hours per week.)

Now Some Arithmetic

Case Finding	10-15	percent
Abstracting	25	percent
Follow-up	25	percent
Administrative	25-30	percent
Quality Control	10-15	percent
Total	95-110	percent

This may explain why your registry is not current! And no time estimate has been added for data analysis and reporting; yet data analysis and dissemination ultimately justify all other cancer registry efforts.

Data Analysis and Reporting

Who needs registry reports? To name just a few: hospital administrators and physicians, managers of our affiliated health system, the state central registry, the CDC and the CoC National Cancer Data Base. And let's not forget that the registry itself needs the quality control benefits derived from data analysis and reporting. Every report is an opportunity to improve data quality. And report generation is the registry's most important means of recognition.

Rules for Salary Setting

One of the most difficult questions is registry supervisor faces is, "How much should I expect to pay a certified tumor registrar (CTR) who manages all facets of registry operation?" In the Feb. 7, 2001 issue of *ADVANCE*, a small article was titled, "If Everyone Wants Me, Why Aren't I Making More Money?" It referred to coders, but the same issues apply to registrars. The article gave three reasons why salaries have been slow to increase:

- Registrars do not generate revenue
- If registrar salaries rise, then supervisor salaries would need to rise; and
- Contract registrars must stay competitive.

Nevertheless, registrar salaries are slowly rising, due in part to the demand in states where only certified registrars are allowed to submit data to the central registry. Certainly salaries vary widely depending on registrar credentials, experience, ancillary duties, hospital demand, geographic location and size, and a host of other reasons. The rule of thumb is, "Pay a certified registry manager like you pay a certified coding supervisor." The duties are very similar. There is wisdom in the old adage, "you get what you pay for."

The Bottom Line

Without use of cancer registry data tomorrow's patient may never obtain improved outcomes. Ultimately, the causes and cures of cancer may never be elucidated unless qualified registrars collect quality data, analyze the data appropriately and report their findings. For registries to focus adequate resources on data analysis, registry efficiency must continue to improve. Test these "rules of thumb" at your facility for setting realistic expectations of efficient registry function.