

**MEDI-LEGAL RESOURCE NEWS**

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**HUMAN BODY BASICS BY BOBBI BLACK RN CLNC****INSIDE THIS ISSUE:****HUMAN BODY BASICS 1****SEAT BELT RESTRAINTS 3****PRESSURE ULCERS 4****CASE LAW UPDATES 5****MULTIFUNCTIONAL FACT CHRONOLOGY 6****HELPFUL INTERNET LINKS 6****Simplify the medical facts.**

- **Effects of Injury or disease upon the entire body.**
- **Effects of pre-existing conditions**
- **Nature of particular injury or disease**
- **Probability of continuance or future course**
- **Future pain and suffering**
- **Ability to engage in activities of daily living.**

All personal injury attorneys spend a significant percent of his/her professional life conferring with doctors, reading medical reports and hospital records as well as taking medical deposition and considering the implications of bodily injury. An understanding of the effects of injury comes with the realization that this body is a single and interworking whole thus trauma is not only inflicted upon a single cell or system but the whole person. This article focuses on a brief explanation of the structure and function of human systems and how they work in an interconnected manner in order to maintain internal conditions essential to the function of the human body network.

To understand body structure and function one must take a fractionalized approach. The human body is made of four basic units: cells, tissues, organs and systems. Cells are the building blocks and the ultimate units of the body. Tissues are masses of cells, similar in structure and function. Primary tissues include: Epithelial which covers internal and external surfaces; Connective: holds organs in place and bind body parts; Muscular involves activities of motion; and Nervous conveys impulses to and from the central nervous system. Organs are combined groups of tissues and do not function independently but operate within the framework of systems. Systems are groups of organs with specific functions: Skeletal, Muscular, Nervous, Cardiovascular, Lymphatic, Gastrointestinal, Genitourinary, Respiratory, Endocrine and Integumentary.

Common Terms

Facets of medical language related to direction, position and movements include: Anterior and

posterior describing front and back, respectively which can also be termed as ventral and dorsal again front to back, respectively. Lateral references away from the midline while medial references toward the midline; Proximal toward the source and distal away from the source; Cranial is toward the head and Caudal is toward the tail. Superior describes above and inferior references below. Anatomical planes describe views of the body. Frontal: divides the body into anterior and posterior portions; medial or midline: passes through center dividing right and left in equal portions; Sagittal: parallel to the long axis or to the median plane and Transverse describes the horizontal passing right angle to both the frontal and median planes, dividing cranial and caudal sections. Anatomical posture is commonly referred to as: Erect, standing position; Supine, on the back; Prone, face and trunk down; lateral recumbent horizontal on either left or right side.

Systems Review

**Skeletal System** is a jointed framework that allows movement as well as gives shape and support. This system is made up of approximately 200 bones and connective fibers, providing attachment points for bones, muscles and ligaments. It has a protective function by enclosing more fragile organs and the hard substance of the bones acts as a storehouse for organic salts. Hemopoiesis or formation of blood cells, goes on within the cavity of the skeleton.

**Muscular system** contains approximately 500 muscles large enough to see with the naked eye and thousands more which can only be visualized with a microscope. The major function of a muscle is to contract and/or shorten allowing

## HUMAN BODY BASICS (CONTINUED FROM PAGE 1)

movement. Ligaments are fibrous band that connect two or more bones together and tendons are long fibrous bands that connect the muscle to the bone or other associated structures.

**Nervous System** is the body's "fast-acting control center." Divided into three main parts: central, peripheral and autonomic and is the "central authority" it coordinates all activity of the body. Functional Units a/k/a neurons are designed to carry impulses or message rapidly over relatively long distances. Interestingly, the complex activities of the Endocrine system are carried out jointly with nervous system as the central nervous system, which acts instantaneously through nerve impulses whereas the endocrine gland is subtle and slowly discharges hormone into the blood and control the activities of the body, more by inference.

**Cardiovascular System** has five principal components: heart, arteries veins, capillaries and blood. The heart, a hollow muscular pump is located in the chest, directly behind the sternum and is enclosed in a membranous sac known as the pericardium. It is divided into left and right chambers; upper portions are the atrial chambers and lower portions are the ventricular chambers. The heart pumps blood via arteries to all body structures, oxygenating the various cells and the venous system returns the oxygen-depleted blood to the heart re-oxygenating and repeating the process. The aorta is the largest artery in the body and arises directly from the left ventricle, arch upward and passes down along the spinal column branching off into other arteries. The lymphatic system is a network of vessels and glands closely associated and confluent with the vascular system. Rich in white blood cells, this colorless fluid circulates throughout via lymph vessels, which carry nourishment to organs and in turn collect waste, which is later filtered by the lymph gland.

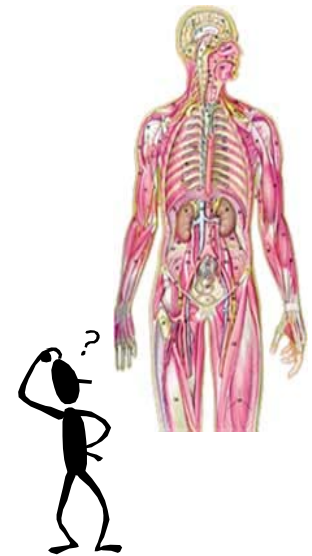
**Respiratory System** involves the interchange of oxygen and carbon dioxide. The nose serves both respiratory and sensory functions and the Pharynx serves as an airway between these nasal chambers, oral routes and larynx (voice box) having a

dual role in both respiration and digestion. The trachea a/k/a "wind pipe" is formed of cartilaginous rings and branches into the bronchi delivering air to the lungs. The diaphragm is a thin muscular, tendinous partition, separating the thoracic cavity from the abdominal cavity and is the chief muscle in respiratory activity. Last but not least the lungs are closed membranous sac located on both sides of the chest surrounded by pleura.

**Gastrointestinal system** includes alimentary canal and accessory organ. Extending from the mouth to the anus, it provides the two major functions of digestion and elimination. The role is to break-down food, remove water and deliver nutrients to the cells. In close proximity is the genitourinary system, which is comprised of two major parts; the urinary organs as well as the organs of the reproductive system. Urinary system includes: ureter, bladder kidney and urethra and functions to remove nitrogen containing wastes from the blood.

**The Integumentary System** is the external body covering a/k/a skin and by far the largest organ of the body, containing 12-15% of the body weight within a surface area of 1-2 meters. It is continues with but structurally distinct from mucous membranes that line the mouth, anus, urethra and vagina. The two distinct layers include the dermis: connective tissue containing elastic fibers, capillaries, nerve endings and sensory receptors and epidermis which is made up of fibrous protein a/k/a keratin and basal cells which contain the pigment producing melanin. The Integumentary system has multiple roles in hemostasis, including protection, temperature regulation, sensory reception biochemical synthesis and absorption.

The organ systems do not work in isolation, instead work together to promote well-being of the entire body and each system is combined and arranged to perform a specific function. From atoms to organisms the body exhibits many levels of structural complexity and as a well-organized unit operating as a whole.



*The Human Body is the most fascinating and fantastic machine in existence. No one completely understands all of its mysteries.*

## SEATBELT RESTRAINT SYSTEMS AND AIRBAG INJURIES

BY ALAN SISSON, MD RPH

The history of restraint system use can be traced back to the horse and buggy days when a rudimentary lap belt system was devised by some owners to literally rope the occupants in place to keep them from falling from the rough riding vehicles. The use of seat belts was unofficially introduced to the automobile industry early on for the same purpose, however, the first US automobile manufacturer to introduce lap belts as standard equipment on all their models was Studebaker-Packard in 1964..

It became rapidly apparent that the “jackknifing” effect injuries incurred in motor vehicle accidents (MVAs) created by the use of a lap belt only (2 point restraint system) required a 3-point restraint system so the diagonal strap shoulder harness adaptation was introduced in the 1970’s. Air bags were tested on a government issue Chevrolet model in 1973, but not offered as an option by General Motors until 1975. Chrysler introduced the first production model cars to feature airbags as standard equipment in 1988.

Statistics clearly show that the proper use of 3-point restraint systems in conjunction with airbags does reduce the total number and severity of injuries in MVAs. There are risks and benefits to almost every innovation aimed at overall safety with no exception being made for 3 point restraint systems and airbags as injuries related to their use do frequently occur as each of these (the lap belt, shoulder harness, and airbag), when used alone, has the possibilities for injuries from mechanisms that are inherent unto itself.

A simple mathematical formula should help illustrate the tremendous forces dispensed to the human body in a MVA. Body weight (lbs) x Speed (mph) approximates the amount of force imparted to the restraint system and thereby to the body. An analogy is that “no one gets hurt by falling” – it is just that sudden stop at the end that causes the injuries. It is important to remember that the 3-point restraint system imposes a varying degree of

upper body torsion (rotation) around the diagonal shoulder belt. Emergency physicians and other healthcare providers have long recognized the “seat belt” sign (abrasions diagonally across the shoulder and chest) as a rough indicator as to the extent of the potential underlying injuries. In one study, 30% of all patients presenting with a positive seat belt sign had internal injuries.

The resultant injuries can generally be classified as either soft tissue/visceral and musculoskeletal. It is well beyond the scope of this newsletter article to be able to discuss each of these injuries in detail.

### Soft tissue/visceral:

Facial and closed head injuries

Spinal cord and peripheral nerve injuries

### Injuries to vital organs

Heart

Lungs

Vascular system

GI tract

Liver

Spleen

Kidneys and bladder

Laryngeal and airway injuries

Contusions and abrasions to skin

### Pregnancy concerns

Traumatic abruption of the placenta

Uterine and amniotic sac rupture

Urinary bladder rupture

### Musculoskeletal:

Fractures and dislocations

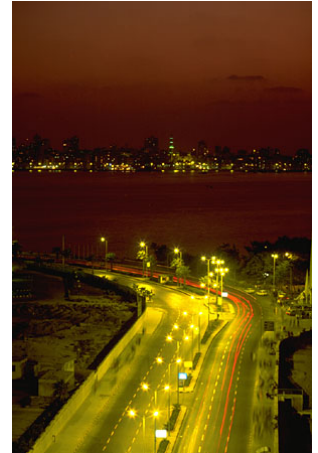
Cervical spine including torsion injuries

Cervical and lumbar muscular strain

Intervertebral disc herniation and rupture

Contusions to the musculoskeletal system

There is a mounting body of evidence that indicates that women suffering breast contusions from shoulder harness and/or airbag use should be followed closely for the subsequent development of breast cancers in the remote future. Breast implants are also at risk of rupture.



Well designed seatbelts fit across the strongest parts of the body—those body parts are most likely to withstand the greatest forces of collision.

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## SEATBELT RESTRAINT AND AIRBAG INJURIES (CONTINUED FROM PAGE 3)

There is a mounting body of evidence that indicates that women suffering breast contusions from shoulder harness and/or airbag use should be followed closely for the subsequent development of breast cancers in the remote future. Breast implants are also at risk of rupture.

The explosive force of airbag deployment against the forward motion of body parts can cause injuries as well as cushion against them. Flying debris, including talc residue (used to lubricate the plastic airbag casing) and plastic fragments can cause eye injuries. The heat generated can cause burn injuries. Cervical spine injuries and death in small children have been widely reported. It is recommended by the National Traffic Highway Safety Association that no child under 80 pounds and 4'9" tall or under 13 years of age be allowed to ride in a passenger position protected by an active airbag. Infant car seats and booster seats for older children make the restraint system adaptable to their diminutive sizes.

There is a significant volume of documentation to support personal injury and product liability claims in this arena of litigation. Conversely, there is also a potential for successful legal action in the areas where injuries occurred due to restraint/airbag usage when it can be demonstrated that said injuries might not have occurred if the restraints had not been used and/or if the equipment was faulty.

The most effective way to augment expert testimony and demonstrate significant injuries to opposing counsel, mediators, and jurors is to have custom illustrations of the client's injuries prepared. This form of demonstrative medical evidence has time and again been shown to be a powerful and effective tool in the attorney's armamentarium with resultant favorable verdicts and higher awards.

*Confusion is the enemy...*

*Studies show that the learning process is 95% visual; so as much demonstrative evidence you can produce, the better chance you have of convincing the jury of your position.*



"there are no pictorial illiterates"

—Leonardo DaVinci—

## PRESSURE ULCERS BY LISA WOLFE RN CLNC

Pressure ulcers, more commonly referred to as bedsores and technically referred to as decubitus ulcers, are caused by prolonged pressure or rubbing on vulnerable areas of the body, most often the bony or cartilaginous areas, prone to friction and moisture. Most common areas include hips, ankles, heels, elbows, ears, and pressure points on the lower back, tail bone (coccyx area) sacrum or iliac crest. Pressure areas result from prolonged lying or sitting positions. The term decubitus is derived from the Latin word "decumbere" which means to lie down.

The mechanism of developing an ulcerated area comes from an external force exerted on the skin, tissue, muscle, and bone by the weight of the body against the surface beneath. These forces cause microcirculatory occlusion as pressures rise above capillary filling pressure causing ischemia. Ische-

mia leads to inflammation and tissue anoxia. Tissue anoxia leads to tissue damage and cell death (necrosis) and ulceration. Irreversible damage may occur in as little as a 2 hour period of uninterrupted pressure.

These sores initially begin as red, painful areas, subsequently turn purple and if left untreated begin to open or ulcerate and eventually become infected. Moist skin areas are more sensitive to tissue ischemia and necrosis and are more likely to become infected.

Skin breakdown is classified by Stages I-IV. Stage I represents skin intact with signs of impending ulceration. Redness, warmth, and induration to the affected area would note this. Stage II represents partial thickness skin loss. Typically described as an abrasion, blister, or superficial ulcer. Stage III represents full-

**Learn more about Decubitus ulcers**

[FAMILYPRACTICENOTEBOOK.COM](http://FAMILYPRACTICENOTEBOOK.COM)

## PRESSURE ULCERS (CONTINUED)

thickness skin loss with extension into the subcutaneous tissues. This lesion would appear as a crater. Stage IV represents full-thickness skin loss with extension into muscle, bone, tendon, or the joint cavity. This is often described as a crater with sinus tracts or tunneling.

Studies suggest that 3 to 10% of hospitalized patient will develop pressure sores. Most commonly these patients will be over 70 years of age or have a neurological impairment that inhibits feeling or the ability to move at will.

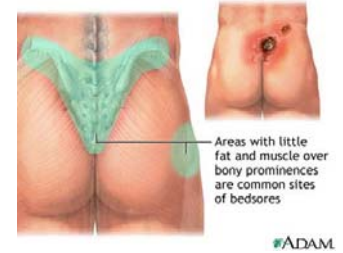
Pressure ulcers are generally preventable or avoidable. Prevention requires skilled staff ensuring proper pressure relieving devices are used, proper nutrition and hydration maintained and that the patient remains clean and dry. Nursing homes and hospitals will usually have prevention programs or protocols in place for their bedridden patients. The Braden and Norton scales are two commonly utilized assessment protocols. Frequent thorough assessment must be continual in order to quickly detect and address signs of skin break-down.

Malnutrition, hypo-proteinemia and anemia reflect overall patient status and can contribute to vulnerability of tissue and delays in wound healing. Poor skin care, urinary or fecal incontinence can contribute to bacterial contamination and are important factors that can delay wound healing.

Pressure ulcers can trigger other conditions which can cause patients considerable pain, suffering and

financial costs. Some of the more common complications include autonomic dysreflexia, urinary system disorders, osteomyelitis (bone infections), anemia, pyarthroses (suppurative arthritis) and in extreme cases a malignant degeneration a/k/a Marjolin ulceration. Complications can become life threatening. The most common causes of fatality typically stem from renal failure or amyloidosis.

The treatment for decubitus ulcers begins with prevention. Turning and repositioning every 2 hours, at a maximum interval or more frequently if indicated, is the cornerstone to maintaining optimal blood flow and limiting opportunity for pressure. Providing padding to bony prominences, preventing tissue trauma, promote nutrition, and hydration are also key elements in the prevention process. Frequent cleansing and established bladder / bowel regimens will help eliminate potential bacterial contamination. Such contamination should be assessed and treated appropriately. Even with optimal medical management many patients require surgical intervention for debridement, release of flexion contractures, wound closure or perhaps amputation. In some cases, it may be necessary to remove the dead necrotic tissue in order to promote the healing process or reconstructive surgery aimed toward improvement of appearance or reducing infection potential or fluid/protein loss through the open wound.



### Risk Factors for Pressure ulcers

- Elderly
- Inability to move
- Malnourishment
- Bedridden or wheelchair
- Chronic conditions such as diabetes or vascular disease
- Urinary or bowel incontinence
- Fragile skin
- Mental disability such as Alzheimer's Disease

## CASELAW UPDATES

[WWW.VERDICTSEARCH.COM](http://WWW.VERDICTSEARCH.COM)

### Product Liability - Camden County, New Jersey

#### Valentini v Ford Motor Co.

An Edison woman was awarded \$20.5M after rollover of 98 Ford Bronco

### Medical Malpractice— New York

#### Kneile v Montefore Medical Center

A Bronx jury awarded \$2.25 million to a woman who claimed she suffered nerve damage as a result of a nurse practitioner's improper insertion of contraceptive implants.

### Medical Malpractice – Cook County

#### Estate of Jenkins v Ostrowski

A gynecologist was found not liable for the death of a 47 year old woman from ovarian cancer.

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**M E D I C A L   R E C O R D   R E V I E W   A N D  
I N T E R P R E T A T I O N**

**“MULTIFUNCTIONAL” MEDICAL RECORD FACT CHRONOLOGY**

A working medical record fact chronology demonstrates the clear course of events unfortunately so many times these valuable instruments are used to merely to store the finished product of case analysis and the solid source facts. However a complete, accurate fact chronology can be one of your most powerful, economical tools and can have dramatic impact on motion practice, trial preparation and case outcomes.

Maximizing the effectiveness:

Step 1; assimilate this raw case material into meaningful format. Generating the medical facts in chronological form allows you to visualize the course of events, compare these facts with your clients' intake interview, pull together the issues involved and develop your strategy and drive you discovery process.

Step 2; connect with your medical experts and other contributing parties. A true, accurate and complete fact chronology should adequately demonstrate all examination parameters, assessment findings and conclusions which can save you time and expense with the medical experts by allowing them quick access to the

**Our mission** is to work as an extension of our attorney clients to expeditiously achieve the most economical approach to revealing the medical facts involved in a health-related case. We believe it is our responsibility to create solutions to help you understand the medical issues involved in turn, allowing you to focus on the law and concentrate on providing services to your client, at the highest possible level.

**Our Newsletter** will be published bi-annually as an informational tool and one more step toward helping you pull together the health-related aspects involved in your cases.

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information they need to form an opinion.

Step 3; as a deposition tool; your fact chronology can help you develop a question list, intended to elicit the facts in response.

Step 4; keeping the facts in front of the court and/or jury. This tool can be entered with the medical records again, allowing all parties to quickly and easily connect with the vital information.

I hope this article has caused you to think anew, the power a complete, thorough, accurate medical fact chronology can bring into the analysis process. As healthcare professionals, we can help you centralize all the medical facts, scrutinize each fact and tighten the language your use to express it. By making sure your fact chronology is as clear and concise as possible, we can help you develop an efficient tool that can be put to good practical use and literally keep the facts at your fingertips. If your not already using a fact chronology, in this proactive way, I hope you will give it a try, with your next health-related case.

**Helpful Internet Links:**

[Find-Law](http://www.findlaw.com/01topics/29litigation/index.html). <http://www.findlaw.com/01topics/29litigation/index.html>

[Medterms](http://www.medterms.com/script/main/hp.asp). <http://www.medterms.com/script/main/hp.asp>

[FDA Drug Information](http://www.fda.gov/cder/drug/DrugSafety/DrugIndex.htm) <http://www.fda.gov/cder/drug/DrugSafety/DrugIndex.htm>