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GLOSSARY

A-weighting network: see definition on p. 8.

Acute gastrointestinal infection: nausea, vomiting, abdominal pain, and diarrhea, generally self-limited and caused by a viral infection of the gastrointestinal tract.

Agoraphobia: an abnormal fear of leaving the house.

Airways: trachea, bronchi, and bronchioles, the tubular structures through which air passes to reach the air sacs or alveoli of the lungs.

Amaurosis fugax: temporary loss of vision in one eye.

Anticoagulation: use of medications such as heparin or warfarin to decrease the tendency of the blood to clot. Higher INR (international normalized ratio of prothrombin time) values, used in the monitoring of warfarin administration, indicate slower or less effective clotting.

Arthralgia: joint pain without objective signs of inflammation (see *arthritis*).

Arthritis: pain and/or stiffness in joints with accompanying objective signs of inflammation, such as redness or swelling.

Ataxia, ataxic: in reference to gait, unsteady on feet, difficulty with balance or coordination in walking, or difficulty maintaining posture, for neurologic reasons.

Asthma: intermittent and reversible respiratory difficulty caused by partial obstruction of small airways by inflammation/swelling and constriction of smooth muscle around the airways. Asthma attacks may be provoked by any kind of respiratory infection, allergic exposures, or irritant exposures.

Atrial fibrillation: an abnormal heart rhythm in which the small chambers do not pump rhythmically, but instead vibrate erratically, placing patients at risk for stroke from blood clots that can form inside the heart.

Autonomic nervous system: the involuntary part of the nervous system that regulates automatic body functions such as heart rate, blood pressure, gastrointestinal function, sweating, glandular output, pupillary reflexes, airway smooth muscle tone, and others. The autonomic system includes sensory receptors (for afferent signals or input to the central nervous system) and effector neurons (for efferent signals or output to organs). It consists of opposing sympathetic and parasympathetic networks. Sympathetic stimulation speeds the heart and readies the body for optimal "fight or flight" activity. Parasympathetic stimulation slows the heart, lowers blood pressure, and facilitates digestion.

Baroreceptors: pressure detectors, as in blood vessels or lungs.

Basilar migraine: migraine with auras representing brainstem effects, including vertigo, tinnitus, fluctuations in level of consciousness, and temporary motor deficits.

Binaural processing: brain integration of neural signals from both ears.

Bilateral: on both sides of the body.

Bone conduction: sound or vibratory stimuli reaching the inner ear via direct solid-to-solid transmission, without passing through or utilizing the tympanic membrane or middle ear ossicles.

C-weighting network: see definition on p. 8.

Caloric test: a test of semicircular canal function and the vestibulo-ocular response. In the caloric response to ice water in the external auditory canal, thermal convection induces fluid movement within the horizontal semicircular canal, creating an illusion of head movement that is reflected in eye movement via the vestibulo-ocular reflex.

Cardiac arrhythmia or dysrhythmia: specific types of irregular heartbeat, often occurring episodically.

Catecholamine: a class of biochemicals that function as neurotransmitters in the brain and as hormones produced by the sympathetic part of the autonomic nervous system, such as epinephrine (adrenalin), norepinephrine, and dopamine.

Central: occurring in the brain (central nervous system), as opposed to a peripheral neural receptor, effector, or organ. For example, central processing, central origin, central dysfunction.

Cerebellum, cerebellar: a posterior/inferior portion of the brain with important functions in coordination and integration of movement.

Chemotherapy: in this report, refers specifically to medications given for cancer treatment.

Cilium, cilia: actively motile, hair-like projections from epithelial cell surfaces in the airways and Eustachian tubes that beat in synchrony to move mucus out of these moist, air-filled spaces, towards the pharynx. Cilia occur on surfaces of other types of cell, including single-celled protozoa.

Circadian rhythm: a daily physiologic cycle, such as sleep and wakefulness or peaks and troughs of cortisol secretion.

Cochlea: spiral-shaped sensory organ of hearing, part of the inner ear membranous labyrinth. See p. 26.

Collagen: a protein which is the chief substance of connective tissue, cartilage, tendons, etc.

Concussion: mild brain injury produced by impact to the head resulting in brief unconsciousness, disorientation, or memory problem.

Coronary artery disease: partial obstruction or narrowing of the small arteries that supply the heart muscle.

Cortex, cortical: the outer cellular layers of the two cerebral hemispheres of the brain.

Cortisol: the major natural glucocorticoid hormone produced by the adrenal cortex in a regular daily rhythm and in response to stress, which exerts diverse effects on tissues and metabolic processes throughout the body.

- Cranial vault:** the space in the skull that contains the brain.
- Diaphragm:** the dome-shaped sheet of skeletal muscle that separates the thoracic (chest) and abdominal cavities and enables breathing.
- Dysfunction:** malfunction or poor functioning.
- Elastin:** an elastic connective tissue protein, which gives elasticity to certain structures, such as arterial walls.
- Electroencephalogram (EEG):** a recording of brain waves monitored in a specific fashion, used in studies of seizure disorder and sleep.
- Epithelial basement membrane:** a thin layer of extracellular proteins and mucopolysaccharides that lies at the base of and supports the layers of cells comprising an epithelium, such as the linings of airways, mouth, esophagus, intestine, pleura, etc.
- Eustachian tube:** a tube that connects the middle ear with the nasopharynx, or upper part of the throat behind the nose. It allows equalization of air pressure on either side of the tympanic membrane.
- Fibromyalgia:** a condition of chronic pain of muscles, ligaments, tendons of unclear origin, without inflammation.
- Gastritis:** inflammation of the lining of the stomach causing pain and nausea.
- Gastroesophageal reflux:** reflux or intrusion of acidic stomach contents into the esophagus; heartburn.
- Gastrointestinal tract:** stomach, small intestine, and colon or large intestine.
- Glucose instability:** in diabetes, fluctuating blood sugar levels that go too high or too low.
- Graviceptors:** neural detectors of gravity and acceleration; see definition on p, 23.
- Great vessels:** the large arteries and veins immediately around the heart, including the aorta, pulmonary artery, pulmonary veins, and superior and inferior vena cavae.
- Hippocampus:** a brain region in the medial temporal lobe critical to spatial navigation and formation of new episodic memories.
- Hyperacusis:** oversensitivity to sound, with normal sounds seeming painfully loud.
- Hypopharynx:** the lower part of the throat, just above the larynx (vocal cords).
- Hypertension:** high blood pressure.
- Immissions:** in acoustics, sound from the point of view of the person or location receiving the sound.
Emissions in this context refers to the sound as it leaves the source.
- Infrasonic:** sound frequency below hearing range, generally considered to be 20 Hz or less.

In utero: in the uterus during pregnancy.

Irritable bowel syndrome: recurrent episodes of abdominal pain and diarrhea, often with alternating periods of constipation, without any pathologic or inflammatory changes in the gastrointestinal tract.

Labyrinthine organs, membranous labyrinth: the inner ear organs, including the cochlea, utricle, saccule, and semicircular canals. See *otolith organs* and *semicircular canals*, and p. 26.

Lower respiratory infection: bronchitis, pneumonia, or pneumonia with pleural effusion (pleurisy).

Lupus: systemic lupus erythematosus, a systemic inflammatory or autoimmune disease affecting the skin, joints, gastrointestinal tract, kidney, blood, and brain.

Magnetic resonance angiography (MRA): a noninvasive imaging method for examining the patency of blood vessels.

Magnetic resonance imaging (MRI): soft tissue imaging using magnetic fields, providing the most detailed images of living brain structure available. Functional magnetic resonance imaging (fMRI) quantifies blood flow to different brain structures during specific activities.

Malaise: a vague sense of not feeling well.

Mastoid: a bony structure immediately behind the ear that contains air-filled cells connected to the middle ear.

Mediastinum: the central portion of the chest or thorax between the lungs, containing the heart, great vessels, trachea, esophagus, lymph nodes, and other structures.

Mesentery: a fold of membranous tissue encasing and attaching the small intestine and other abdominal organs to the inside of the peritoneal (abdominal) cavity, also supporting blood vessels and nerves to the organs.

Microvilli: hair-like projections from epithelial cell surfaces that increase absorptive surface area, for example, in the small intestine.

Migraine: a hereditary, episodic, neurologic condition generally involving severe headaches that may be preceded by visual or other sensory phenomena such as tingling or numbness (aura), with symptoms of nausea and sensitivity to light and sound commonly accompanying headaches. A headache may be one-sided or pounding. Aura and accompanying symptoms may include vertigo, tinnitus, temporary focal weakness or paralysis, temporary loss of vision, vomiting, or loss of consciousness. Sensory sensitivities and triggers include motion, odors, a wide variety of foods (especially products of fermentation or aging, caffeine, chocolate, and varieties of plants), hormonal state, and sleep deprivation.

Migraineur: a person who gets migraines.

Myocardial infarction: heart attack, or obstructed coronary blood flow leading to death of cardiac muscle.

- Neuroanatomic:** referring to the anatomy of neural linkages in the brain.
- Neuroendocrine:** relating to cells or tissues that release hormones into the blood in response to a neural stimulus.
- Night terror:** a parasomnia, or sleep disturbance occurring during disordered arousal from the deeper stages of sleep, in which a person (usually a child) may scream, act afraid, say nonsensical things, or get up to do irrational or fearful things, all without memory in the morning.
- Nocturia:** awakening and getting up repeatedly in the night to urinate.
- Nocturnal enuresis:** bedwetting while asleep.
- Norepinephrine:** a central catecholamine neurotransmitter, sympathetic nervous system neurotransmitter, and vasoactive adrenal medullary hormone.
- Nystagmus:** a pattern of eye movement indicating a disordered vestibulo-ocular reflex that is often due to disordered vestibular signaling or processing, as in the caloric test.
- Ocular:** pertaining to the eyes.
- Orbit:** the eye socket or hollow space in the skull that contains the eyeball and its associated structures.
- Otolith organs:** the utricle and saccule, labyrinthine organs of the inner ear that detect linear acceleration, including gravity, by virtue of microscopic calcium carbonate stones or *otoconia* positioned in a protein matrix over the mechanically sensing hair cells. See p. 26.
- Palpitations:** irregular or pounding heart at times not expected from activity or exertion.
- Panic attack:** an episode of sudden intense fear out of proportion to circumstances, which may be accompanied by symptoms of dizziness, sweating, trembling, chest pain, palpitations, and the feeling of not being able to get enough breath.
- Parabrachial nucleus:** Pontine brain center involved in extended vestibular system influence
- Parasomnia:** a sleep disturbance occurring during disordered arousal from the deeper stages of sleep, such as sleep walking, sleep talking, and night terrors.
- Paresthesia:** tingling or "pins and needles" sensation, as when a numb extremity is waking up.
- Parkinson's disease:** a neurologic degenerative disease involving dopamine-producing neural tracts in the brain and affecting movement and psychiatric status.
- Pericardium:** the two-layered membranous sac that encloses the heart and the roots of the great vessels, in which the heart beats.
- Perilymphatic fistula syndrome:** see p. 30.
- Pharynx:** the throat.

- Pleura:** the outer epithelial surface of the lung and the lining of the thoracic cavity, providing low friction surfaces for lung movement.
- Polyuria:** excessive daily volume of urine, a typical sign of high glucose levels in diabetics.
- Positron emission tomography (PET):** a method of functional imaging that quantifies glucose uptake by different brain regions as a measure of activity.
- Posturography:** a form of balance testing that is sensitive to the vestibulo-spinal reflexes, including the influence of inner ear, visual, somatosensory, and central processing on the movements by which a subject remains balanced and upright.
- Pressure equalization tube:** a tube inserted through a small, surgically placed hole in the tympanic membrane after removal of middle ear fluid, to provide aeration.
- Resonance:** a property of sound; see pp. 7 and 25.
- Retina, retinal:** the light-sensing neural structure at the back of the eye.
- Scotoma:** temporary loss of vision in one part of the visual field.
- Semicircular canals:** bilateral labyrinthine organs of the inner ear that detect angular acceleration of the head by virtue of fluid shifts deflecting mechanically sensing hair cells. See p. 26 and *caloric test*.
- Serotonin:** a brain and gastrointestinal neurotransmitter.
- Serous otitis media:** viscous fluid in the middle ear (middle ear effusion) that may obstruct sound transmission, usually occurring after a series of acute ear infections.
- Sequela, sequelae:** a pathologic condition that develops from another pathologic condition, such as chronic middle ear fluid and hearing loss being sequelae of repeated acute ear infections.
- Somatic nervous system:** the sensory and motor nervous system from and to the skin, skeletal muscles, and associated tendons and ligaments, whose signals may be consciously perceived and voluntarily modified.
- Somatosensory:** sensory input from the skin, skeletal muscles, tendons, and ligaments.
- Sonic:** sound frequency in the range of human hearing.
- Tachycardia:** rapid heartbeat.
- Taxon, taxa:** a group or groups in the scientific categorization (Linnaean taxonomy) of living things.
- Temporal bone:** solid bone at the base of the skull, in which the labyrinthine organs lie.
- Thalamus:** a part of the brain involved in part in relaying sensory information to the cerebral cortex.
- Tinnitus:** "ringing in the ears," which may be a tonal sound, buzzing, white noise, or other types of sound heard in one or both ears. The sound itself is not present in the outside environment.

Trachea: the large central airway between the larynx (voice box) and the split or bifurcation of the right and left bronchi.

Tympanic membrane: eardrum; the layer of taut, thin tissue that separates the external auditory canal from the middle ear.

Ulcer: duodenal or gastric ulcer.

Ultrasonic: sound frequency above hearing range, generally considered to be 20,000 Hz or more.

Upper gastrointestinal symptoms: gastroesophageal reflux, gastritis, and/or ulcer.

Vasculitis: inflammation of blood vessels, which can cause restriction of blood flow.

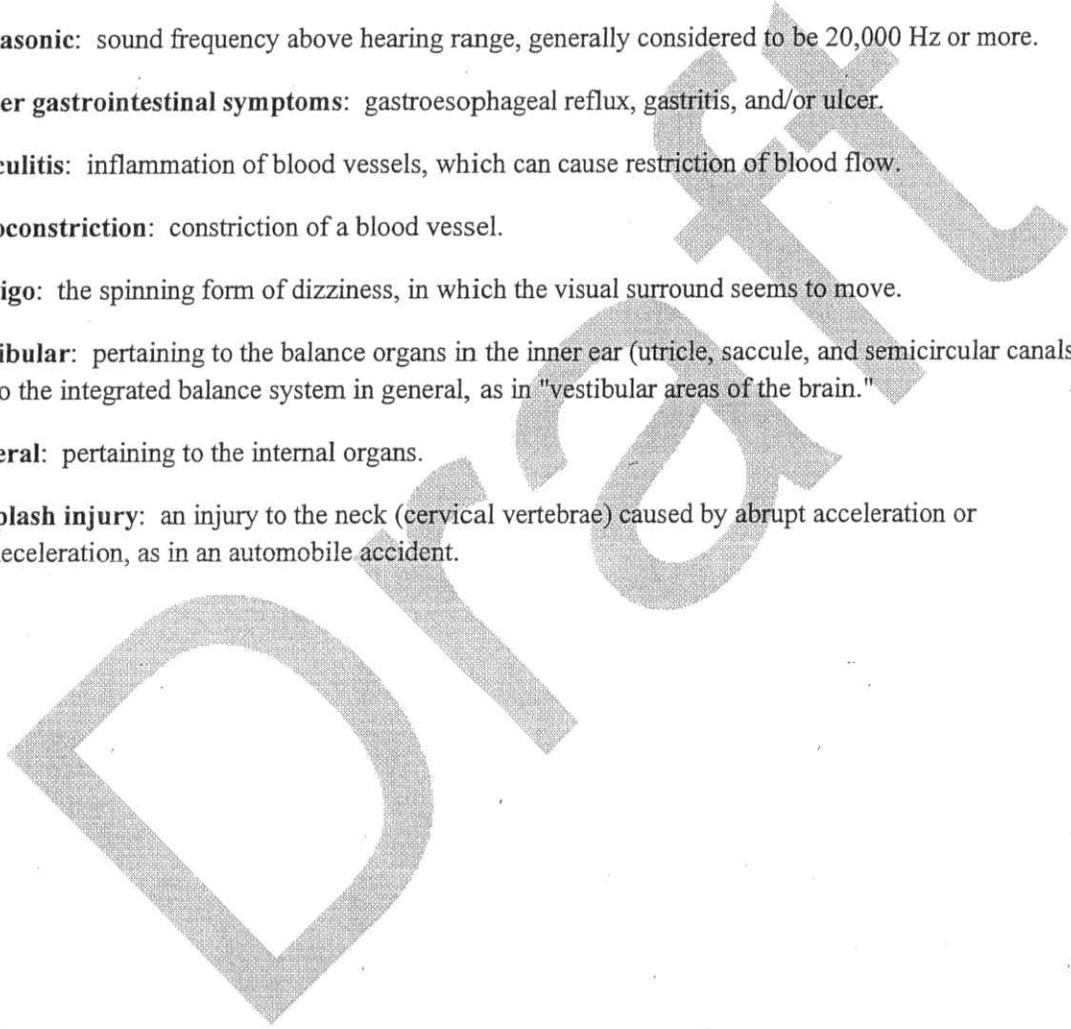
Vasoconstriction: constriction of a blood vessel.

Vertigo: the spinning form of dizziness, in which the visual surround seems to move.

Vestibular: pertaining to the balance organs in the inner ear (utricle, saccule, and semicircular canals) or to the integrated balance system in general, as in "vestibular areas of the brain."

Visceral: pertaining to the internal organs.

Whiplash injury: an injury to the neck (cervical vertebrae) caused by abrupt acceleration or deceleration, as in an automobile accident.



ABBREVIATIONS

χ^2	chi-squared statistic or test
CT	computerized tomography
dB	decibels
dBA	decibels measured with an A-weighted filter
dBC	decibels measured with a C-weighted filter
CSF	cerebrospinal fluid
EEG	electroencephalogram
EH	endolymphatic hydrops
ft	feet
Hz	Hertz (frequency in per second or sec^{-1})
INCE	Institute of Noise Control Engineering
INR	international normalized ratio of prothrombin times (see <i>Glossary</i> : anticoagulation)
km	kilometers (1000 m)
m	meters
mcg	micrograms
mg	milligrams
mi	miles
MRA	magnetic resonance angiography
MRI	magnetic resonance imaging
MW	megawatts
p	when used in the context of a statistical test, p means probability that the compared distributions are no different from each other
P.E.	professional engineer
PET	positron emission tomography
PTSD	post-traumatic stress disorder

VVVD visceral vibratory vestibular disturbance (defined in this paper, p. 11)

WHO World Health Organization

WTS Wind Turbine Syndrome

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EDUCATION AND TRAINING**Education**

1991	M.D.	The Johns Hopkins University School of Medicine
1985	Ph.D.	Princeton University (Ecology, Evolution, and Behavior)
1981	M.A.	Princeton University (Ecology, Evolution, and Behavior)
1977	B.A.	Yale University (cum laude)
1973		Milton Academy, Milton, Mass.
1970		New Canaan Country School, Conn.

Post-Doctoral Training

1992 to 94	Pediatrics	Dartmouth-Hitchcock Medical Center, Lebanon, NH
1991 to 92	Pediatrics	Children's National Medical Center, Washington, DC
1985 to 86	Ornithology	American Museum of Natural History, New York, NY

Licensure and Certification

1997	Licensed Physician, New York
1997	Licensed Physician, New Hampshire (expired)
1995	Pediatric Advanced Life Support (recertified 2002)
1994	Diplomate, American Board of Pediatrics (recertified 2008, expires 2015)
1994	Licensed Physician, Alaska (expired)
1994	DEA Registration
1994	Advanced Trauma Life Support Provider (expired)

- 1994 Advanced Cardiac Life Support Provider (expired)
 1992 Neonatal Advanced Life Support Provider (recertified 2003)

Continuing Education

- 2008 Intermediate Training in the Psychological Treatment of Children with Trauma-Attachment Problems - Daniel A. Hughes, Ph.D. (32 hours)
 2007 Training in the Psychological Treatment of Children with Trauma-Attachment Problems - Daniel A. Hughes, Ph.D. (32 hours)
 2006 Workshop in Basic Pediatric Hypnosis (20 hours)
 2006 Introductory Theraplay Training (27 hours)
 2005 Psychiatry: Comprehensive Update and Board Preparation (Harvard, 51 hours)
 2005 ADHD Across the Life Span (Harvard, 22 hours)
 2004 Gesell Developmental Evaluation, Anthony Malone, M.D., Latham, NY (6 days)
 2002 Promoting Student Success (Melvin Levine, M.D., U. of N. Carolina, 20.5 hours)
 2002 Psychiatric Neuroscience Home Study Course (Harvard, 16.5 hours)
 2000 Child and Adolescent Psychopharmacology (Harvard, 20 hours)
 1998 Clinical Diagnosis and Treatment of Fetal Alcohol Syndrome (7.5 hours)
 1997 Pediatric and Adolescent Gynecology (Harvard, 14 hours)

PROFESSIONAL APPOINTMENTS

Hospital or Affiliated Institution Appointments

- 2004 to Consulting Pediatrician Alice Hyde Medical Center, Malone, NY
 2000 to 03 Senior Attending in Pediatrics Bassett Healthcare, Cooperstown, NY
 1997 to 00 Attending Pediatrician Alice Hyde Medical Center, Malone, NY
 1995 to 96 Chief of Pediatrics Yukon-Kuskokwim Delta Regional Hospital, Bethel, AK (Yup'ik Eskimo)
 1994 to 95 Staff Pediatrician Yukon-Kuskokwim Delta Regional Hospital, Bethel, AK

Other Professional Positions

- 1998 to 00 Private Practice (Solo) Pediatrics Malone, NY
 1997 to 00 Staff Pediatrician St. Regis Mohawk Health Services, Hogansburg, NY
 1997 to 98 Staff Pediatrician North Country Children's Clinic, Malone, NY

Academic Appointments

- 2000 to 03 Assistant Clinical Professor of Pediatrics Columbia University College of Physicians and Surgeons
 1980 to 85 Teaching Assistant Princeton University
 1978 Teacher Children's School of Science, Woods Hole, MA
 1977 to 78 Research Assistant Yale University

LANGUAGES SPOKEN Spanish, French

AWARDS AND HONORS

- 1984 National Science Foundation Dissertation Grant (Princeton)
 1979 to 82 National Science Foundation Predoctoral Fellowship (Princeton)
 1979, 80 Dunlop Prize, Biology Department, Princeton University

- 1981 to 83 Research grants from the National Academy of Sciences, American
 Museum of Natural History, American Ornithologists' Union, and others
 1973 National Merit Scholar to Yale University

MAJOR ADMINISTRATIVE RESPONSIBILITIES

- 1995 to 96 Chief of Pediatrics Yukon-Kuskokwim Delta Regional Hospital, Bethel,
 AK

PROFESSIONAL SOCIETY INVOLVEMENT

- 1997 to American Academy of Pediatrics Fellow
 2000 to Medical Society of the State of New York
 2006 to Franklin County Medical Society
 2000 to 03 Otsego County Medical Society

COMMUNITY SERVICE

- 1998 to 00 Physician member, Child Abuse Response Team, Franklin County, NY
 1994 to 96 Physician member, Child Abuse Response Team, Yukon-Kuskokwim
 Delta, AK

GRAND ROUNDS

- May 1994 "Infectious Diseases in Yup'ik Eskimos" at Dartmouth-Hitchcock Medical
 Center (Lebanon, NH)
 May 2001 "Vaccinations: The Debate" at Bassett Healthcare (Cooperstown, NY)
 March 2002 "Evaluation of Children and Adolescents with Behavior and Learning
 Problems" at Bassett Healthcare (Cooperstown, NY)
 April 2002 "Vaccinations: An Overview for Family Practitioners" at Bassett Hospital
 of Schoharie County (Cobleskill, NY)
 Feb 2003 "A Neurodevelopmental Approach to ADHD" at Bassett Healthcare
 (Cooperstown, NY)

BIBLIOGRAPHY

Original reports

Pierpont N, Fitzpatrick JW. Specific status and behavior of *Cymbilaimus sanctaemariae*, the Bamboo Antshrike, from southwestern Amazonia. *Auk* (Journal of the American Ornithologists' Union) 1983; 100: 645-52.

Terborgh JT, Robinson SK, Parker TA, Munn CA, Pierpont N. Structure and organization of an Amazonian forest bird community. *Ecological Monographs* 1990; 60: 213-38.

Proceedings of Meetings

Pierpont, N. Competencia y coexistencia de trepadores [Competition and coexistence of woodcreepers]. In: Rios MA, ed. *Reporte Manu*. Lima, Peru: Centro de Datos para Conservacion, 1985, 13 pp.

Abstracts

Pierpont N. Interspecific dominance and the structure of woodcreeper guilds [Abstract]. American Zoologist 1983; 23: 1001.

Pierpont N. Interspecific aggression and the ecology of woodcreepers (Aves: Dendrocolaptidae). Ph.D. Dissertation, Princeton University, Princeton, NJ. Ann Arbor, Michigan: University Microfilms, 1986; Abstract No. 8602443.

Pierpont N. Habitat selection induced by interspecific aggression in Amazonian birds [Abstract]. Proceedings of the IV International Congress of Ecology, Syracuse, N.Y., 1986, p. 271.

Karron RA, Singleton RJ, Petersen KM, Bonilla D, Hughes B, Davidson N, Bulkow L, Pierpont N, Wainwright R, Santosham M, Harrison LH. RSV is a frequent cause of hospitalization in Alaska Native infants. Poster, ICAAC meeting, 1995.

Newspaper column, The Malone (NY) Telegram

- 9/9/06 ADHD: Young Children, Self-Regulation, and Look-Alike Problems
- 9/23/06 ADHD: Older Children: Mental Energy and Consistency
- 10/7/06 ADHD: In One Ear and Out the Other (Processing Controls)
- 10/23/06 What Elephants Teach Us about Children
- 11/4/06 ADHD: Look Before You Leap (Production Controls)
- 11/18/06 Mapping the World onto the Brain: Neurological Templates for Learning
- 12/2/06 Childhood Adverse Experiences and Long-Term Health (ACE Study)
- 12/16/06 Autism from the Inside (Temple Grandin)
- 1/7/07 Mirror Neurons and Autism
- 1/20/06 Autism, Asperger's, and Non-Verbal Learning Disabilities
- 2/3/07 Concussions: Short- and Long-Term Effects
- 2/17/03 Play + Therapy = Theraplay
- 3/3/07 Sick Of Poverty: Poverty, Stress, and Health
- 3/17/07 TV, Video Games, and Kids
- 4/3/07 Punished by Rewards: Research on Behaviorism
- 4/21/07 The Genius of Inner Motivation
- 5/12/07 Warbler Wave: Healing and Nature
- 5/26/07 Plan B: Collaborative Problem Solving

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6/9/07 Try Collaborative Problem Solving

Wind energy

Pierpont N. Health, hazard, and quality of life near wind power installations: How close is too close? Malone (New York, USA) Telegram, March 2, 2005, p. 5.

Pierpont N. Health effects of wind turbine noise. Report presented to NY State legislators, February 3, 2006.

Pierpont N. Wind turbine syndrome. Testimony before the New York State Legislature Energy Committee, March 7, 2006.