

THE MEDICAL EVALUATION AND PATIENT RISK ASSESSMENT

LOCAL ANESTHESIA

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- > Serious reform of resident duty hours began in 1984 after the tragic death of 18-year-old Libby Zion at New York Hospital, due to a simple medical error. Zion came to the ER complaining of fever and chills and was seen by a junior resident who discussed the case by telephone with the referring physician. Zion was believed to have a common viral syndrome, was admitted to the medical service at 2 AM and was given Tylenol. The junior resident and intern re-examined Zion together later and prescribed meperidine, a strong analgesic, for chills and "agitation," in spite of the fact that the physicians knew Zion took phenelzine, a common antidepressant at the time. Phenelzine is from a class of drugs known as MAO inhibitors, which interact poorly with meperidine. All MAO inhibitors are and were commonly known to be potentially fatal - resulting in a "hypertensive crisis," characterized by convulsive seizures, fever, marked sweating, excitation, delirium, tremor, coma, and circulatory collapse - when taken in combination with drugs like meperidine.
- > After receiving the meperidine, Zion was noted to be restless and confused. The intern, responsible for numerous other patients and having already worked more than 18 hours without a break, ordered restraints and haloperidol, a sedating antipsychotic. By 6 AM Zion had an axillary temperature of 42° C (normal 37.5° C). Shortly thereafter she went into respiratory arrest and died.

Determination of Medical Risk

- ☞ Is the patient capable, physically and psychologically, of tolerating in relative safety the stresses involved in the proposed treatment?
- ☞ Does the patient represent a greater risk (of morbidity or mortality) than normal during this treatment?
- ☞ If the patient does represent an increased risk, what modifications will be necessary in the planned treatment to minimize this risk?
- ☞ Is the risk too great for the patient to be managed safely as an outpatient in the medical or dental office?

Physical Status Risk Classification (ASA, 1962)

- ASA I – no systemic disease; a normal, healthy patient
- ASA II – mild-moderate systemic disease with significant risk factors; medically stable
- ASA III – severe systemic disease that limits physical activity; medically fragile but not incapacitating
- ASA IV – incapacitating systemic disease that is a constant threat to life; medically debilitating
- ASA V – moribund, not expected to survive 24 hours

Oral Risk Assessment

Levels of risk for dental procedures

- ORA I – very low risk of adverse reaction (records, exam, impressions)
- ORA II – minimal risk for stimulating an adverse reaction (routine simple procedures, LA,)
- ORA III – moderate risk...(complicated procedures, extractions, sedation)
- ORA IV – significant risk...(complex procedures and surgery, infections, sedation)
- ORA V – very high risk...(severe infections, trauma, surgical treatments, sedation and GA)

Three Key Questions

- ☞ Are you currently being treated by a doctor for any medical condition?
- ☞ Have you ever been hospitalized for an illness or operation?
- ☞ Are you currently taking any medications?

MEDICAL EVALUATION

- **Chief Complaint**
- **History of Present Illness**
- **Past Medical History**
- **Review of Systems**
- **Physical Examination**
- **Diagnostic Studies**
- **Assessment/Differential Diagnosis**
- **Plan/Procedure**

Chief Complaint

- **Pain**
- **Swelling**
- **Bleeding**
- **Trauma**
- **Difficulty swallowing/breathing**
- **“Bite off”**
- **Facial deformity (developmental)**

History of Present Illness

Story in Chronological Order

- **Location**
- **Timing**
- **Radiation**
- **Exacerbates ??**
- **Duration**
- **Alleviates ??**
- **Quality**
- **Neurosensory deficit**
- **Intensity**
- **Motor deficit**
- **Autonomic findings**

Patient Evaluation and Risk Assessment

MEDICAL EVALUATION

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Past Medical History

- **Cardiovascular**
- **Pulmonary**
- **Hematological**
- **Liver/GI**
- **Endocrine**
- **Renal**
- **Immunological/Rheumatological**
- **Neurological**
- **Infectious Disease**
- **Immunocompromised states**

Past Medical History

- Hospitalizations
- Surgical history
- Family history
- Psychosocial history
- Habit history
- Drug history
- Allergies/Adverse drug reactions
- Medications

Cardiovascular Disease

- Hypertension
- Rheumatic fever, RHD, murmurs
- Congenital heart disease
- Valvular disease
- Infective endocarditis
- Angina/Ischemic heart disease
- Heart failure/CHF
- Arrhythmias
- Valve replacement
- Heart transplant

Pulmonary Disease

- Asthma
- Chronic Obstructive Disease
 - Chronic bronchitis
 - Emphysema
- Tuberculosis
- Cystic fibrosis
- Lung cancer
- Lung resection
- Lung transplant

Hematological Disease

- Thrombocytopenic purpuras – platelets
- Hemophilia A/B – factor deficiencies
- Von Willebrand's disease
- Coumadin therapy – anticoagulation
- Aspirin therapy
- Blood dyscrasias (anemia, WBC)

Liver/GI Disease

- Hepatitis – A, B, C, D, etc.
- Cirrhosis
- Liver failure – transplant
- GERD - esophagitis
- Duodenal/stomach ulcer disease
- Ileitis/colitis
- Malabsorption/diarrhea
- Irritable bowel syndrome

Endocrine Disease

- Diabetes Mellitus
- Thyroid disorders – hyper/hypo-
- Hypothalamic/pituitary disorders
- Adrenal disorders
- Steroid therapy
- Hormone replacement therapy
- Oral contraceptives

Renal Disease

- **Primary glomerular disease**
- **Acute/chronic renal failure**
- **Nephrolithiasis**
- **Renal cysts and cystic disease**
- **Neoplasms**
- **Dialysis therapy**
- **Kidney transplant**

Immunologic/Rheumatologic Disease

- **Rheumatoid arthritis/JRA**
- **Osteoarthritis**
- **Osteomyelitis**
- **Osteoporosis**
- **Systemic lupus erythematosus**
- **Polymyositis/dermatomyositis**
- **Temporal arteritis/Polymyalgia rheumatica**
- **Fibromyalgia**
- **Chronic fatigue syndrome**
- **Joint replacements**

Neurological Disease

- **Seizure disorder (epilepsy)**
- **Multiple sclerosis**
- **Cerebrovascular accident (Stroke)**
- **Parkinson's disease**
- **Dystonia/dyskinesia**
- **Peripheral neuropathies/NMJ disorders**
- **Mental retardation**
- **Cerebral palsy**
- **Muscular dystrophy**

Infectious Disease

- **STD's**
- **Tuberculosis**
- **Lyme disease**
- **Herpes virus (I and II)**
- **Hepatitis virus**
- **Cytomegalovirus (CMV)**
- **Epstein Barr virus (EBV)**
- **Human Immunodeficiency virus (HIV) - AIDS**

Immunocompromised States

- **Organ transplant**
- **Bone marrow transplant**
- **Chemotherapeutic agents**
- **Radiation therapy**
- **HIV disease/AIDS**
- **Pregnancy??**

Hospitalizations/ Surgical History

- **Reason(s)**
- **Frequency**
- **Course/Complications**
- **General anesthesia problems**
- **Medication problems**
- **Bleeding problems**

Habit/Drug History

- Alcohol
- Tobacco (nicotine)
- Marijuana
- Cocaine
- Opioids
- Benzodiazepines
- Other CNS stimulants
- Herbal medicine

Allergies/ Adverse Drug Reactions

- Penicillin's
- Other antibiotics (Sulfa drugs)
- Anti-inflammatory drugs (Aspirin & NSAIDs)
- Codeine and other opioids
- Local anesthetics??

Current Medications

MEDICAL EVALUATION

- Chief Complaint
- History of Present Illness
- Past Medical History
- Review of Systems
- Physical Examination
- Diagnostic Studies
- Assessment/Differential Diagnosis
- Plan/Procedure

Review of Systems

- General
- Skin
- Head, eyes, ears, nose and throat
- Neck
- Cardiovascular
- Chest
- GI/GU
- OB/GYN
- Neurological
- Psychiatric

Physical Examination

-  Inspection
-  Palpation
-  Percussion
-  Auscultation

Vital Signs

- **P**ulse rate
- **B**lood pressure
- **R**espiration rate
- **T**emperature
- **P**ain level

Physical Examination

- **S**kin
- **H**EENT
- **N**eck
- **C**ardiac
- **L**ungs
- **A**bdomen
- **M**usculoskeletal
- **N**eurological

LOCAL ANESTHESIA

CONTRAINDICATIONS

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1. **Absolute**
2. **Relative**

Allergic Reactions

- **Local anesthetic – ester vs. amide**
- **Sulfa compounds – LA (articaine)**
- **metabisulfite preservative (vasoconstrictors)-no cross reaction with true “sulfa” allergy**
- **Methylparaben***

Allergic Hypersensitivity

Table 17-4. Classification of allergic diseases (modified from Coombs and Gell)

Type	Mechanism	Principle antibody or cell	Time of reactions	Clinical examples
I	Anaphylactic (immediate, histoneotropic, antigen induced, antibody mediated)	IgE	Seconds to minutes	Anaphylaxis (drugs, insect venom, antisera) Asthma, bronchial asthma Allergic rhinitis Urticaria Angioedema Hay fever
II	Cytotoxic (antimembrane)	IgG, IgM (activate complement)	—	Transfusion reactions Goodpasture's syndrome Autoimmune hemolysis Hemolytic anemia Certain drug reactions Membranous glomerulonephritis
III	Immune complex (serum sickness-like)	IgG (form complexes with complement)	6 to 8 hours	Serum sickness Lupus nephritis Occupational allergic alveolitis Acute viral hepatitis
IV	Cell-mediated (delayed) or tuberculin-type response	—	48 hours	Allergic contact dermatitis Infectious granulomas (tuberculosis, mycoses) Tissue graft rejection Chronic hepatitis

CONTRAINDICATIONS

1. **Absolute**
2. **Relative**

Atypical Plasma Cholinesterase

- Inherited autosomal recessive trait
- Rare, 1 in every 2820 (6-7%)
- LA – Elevated levels of ester local anesthetics

Malignant Hyperthermia

- Autosomal dominant
- Males > Females
- Abnormal reaction to certain medications including volatile inhalational gases and succinylcholine
- Release of Ca from sarcoplasmic reticulum triggering muscle contractions
- **Muscle rigidity, metabolic acidosis & elevated core body temperature

Malignant Hyperthermia

- Succinylcholine (77% of cases)
- Halothane (60% of cases)
- Previously believed to cause MH
 - Lidocaine
 - Mepivacaine

Methemoglobinemia

- Acquired through drugs or chemicals that are able to increase the formation of methemoglobin.
- Normal – 99% of Hb in the ferrous state, 1% in the ferric state. Methemoglobin reductase enzyme is normally functioning.

Methemoglobinemia

- Articaine (Ultracaine)
Prilocaine (Citanest)
Benzocaine (Hurricane Spray, Oragel)
- Oxidizes ferrous to ferric iron form of Hb and blocks the methemoglobin reductase pathway
- Methemoglobin levels increase (1.5 g/dl) develop 3-4 hrs after drug administration

Medical History (Physical Status)

- Cardiovascular (uncontrolled HTN, recent MI, chest pain, coronary artery disease)
- Pulmonary (acute respiratory infection, asthma attack)
- Hematological (bleeding disorder)
- Liver/GI (cirrhosis)
- Endocrine (uncontrolled hyperthyroidism)
- Renal (renal insufficiency or failure)
- Immunocompromised states (leukemia)
- Pregnancy

Medical History (Physical Status)

- Psychosocial history
- Allergies/Adverse drug reactions
- Medications (**MAO inhibitors, Tricyclic antidepressants and epinephrine**)