

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

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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
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- Diagnostic Studies
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- 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

-  **Pulse rate**
-  **Blood pressure**
-  **Respiration rate**
-  **Temperature**
-  **Pain level**

Physical Examination

- **Skin**
- **HEENT**
- **Neck**
- **Cardiac**
- **Lungs**
- **Abdomen**
- **Musculoskeletal**
- **Neurological**

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 anti-body or cell | Time of reactions | Clinical examples |
|------|--|--------------------------------------|--------------------|--|
| I | Anaphylactic (immediate, hypersensitivity, 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)**