Putting Together Unit I NR33
Most of the slides in this presentation are in your previous powerpoints....
Profs D'Ambrosia & Winstanley

Where do I begin to study?
• http://www2.sunysuffolk.edu/mccabes/NR33studyguidelines.htm

Approach to reading

» scan headings and subheadings before the start of reading session
  • a heading when turned into a question is answered by the list of subheadings

» starting the reading session
  • turn the heading into a question
  • read the passage to answer the question
  • highlight only information that answers the question
  • repeat for each heading and subheading

» review your reading
  • reread the highlighted information
  • reading aloud
  • reading into a tape recorder
    • allows for review at a later time

Managing information that is not understood

• use of faculty resources
  • appointment during office hours
• use of other resources
  • patient resources
    • learn topics from a patient perspective
    • written in simpler language
    • education sheets and online information from HON sites
  • nursing references
    • learn topics from other professional sources
    • current med/surg nursing texts
    • nursing journal articles

Managing information that is not understood

• participation in class
  – review handouts prior to class
  – seek clarification of information not understood
    » submit a question in writing to professor
• debriefment after class
  – review of lecture material
    » compare lecture material to written references
      • approach it slide by slide
      • find reference in text book that correlates to lecture information
        • helps to make connections
        • develops use of multiple references

Content map for Medications

• What are the indications?
  •
  •
  •
• What is the therapeutic effect?
• What are the side effects?
• What are the contraindications?
• What are the patient teaching points/nursing considerations?

7) OH MY GOSH?
• What does the nurse need to know to safely and competently give a medication?
• What does the nursing student need to say to the client about the medication that makes the client feel comfortable taking the medication?

8) Medications:
• Study them by class
• Review the charts in Iggy
• Be familiar with the medications used in the case studies

9) Evaluation of preparation
• Answering practice questions
  – Practice question sources
    » Website for text
    • Self assessment quizzes organized according to chapter
    » NCLEX review books organized according topic
    » NCLEX software in computer lab
  – Take care of yourself
    » Rest, diet, exercise, relaxation techniques

10) Pharmacology Basics
• Pharmacokinetics; Definitions
  – Pharmacokinetics is the study of drug movement throughout the body.
• There are 4 basic pharmacokinetic processes;
  1) Absorption
  2) Distribution
  3) Metabolism
  4) Excretion

11) Pharmacokinetics Events
12) Pharmacokinetics; 4 Processes
13) Clinical Relevance of Pharmacokinetics

14) Pharmacology and the Respiratory System
15) Pathophysiology of Asthma
• Reversible, intermittent airflow obstruction
• Can be fatal
• Airway obstruction can occur 2 ways
  – Inflammation
    • Obstructs the lumen of the airway
  – Airway hyperresponsiveness
    • Obstructs airways by constricting bronchial smooth muscle
Asthma: The Step System

I: Mild or Intermittent
- Symptoms occur ≤ 2x week, symptom free b/w episodes. Symptoms short lasting only few hours
- PFT normal b/w episodes

II: Mild Persistent
- Symptoms occur > 2x week, not daily. Present @ night 2x mos. Activity affected

III: Moderate Persistent
- Symptoms occur daily. Persist for days. Symptoms present @ night at least once/week

IV: Severe Persistent
- Symptoms continuously present. Limited physical activity. Episodes frequent.

Medical Management of Asthma
- Education
- Drug therapy
  1. Bronchodilators
  2. Anti-inflammatory agents
  3. Corticosteroids
  4. Mast cell stabilizers
  5. Leukotriene antagonists
- Exercise/activity
  - aerobic exercise is encouraged to improve overall pulmonary function
  - Instruct patient to use inhaler prior to exercise
- prevention and early identification of complications airway remodeling

Medical Management of Asthma
- Inhaled Therapy in Airway Disease
- Wide variety of devices available for drug delivery
  - Metered Dose Inhalers (MDI)
  - Dry Powder Inhalers
  - Nebulizers
- Effective use requires patient effort and cooperation

Major Drugs for Asthma (1)
- Bronchodilators
- Beta2 adrenergic agonists
- Inhaled-short-acting
• Albuterol [Proventil, Ventolin]
• Bitolterol [Tornalate]
• Terbutaline [Brethaire]

• Inhaled-long-acting
  – Salbutamol [Serevent]
  – Formoterol [Foradil]

• Oral
  – Albuterol [Proventil, Ventolin]
  – Terbutaline [Brethaire]

21 **Major Drugs for Asthma (2)**

• Bronchodilators (Cont’d)
• Methylxanthines
  – 1. Theobromine
  – 2. Theophylline
  – 3. Caffeine

• Anticholinergics
  – 1. Ipratropium
  – 2. Tiotropium

22 **Major Drugs for Asthma (3)**

• Anti-inflammatory Drugs
• Corticosteroids
• INHALED
  – Beclomethasone dipropionate [Beclovent, Vandercil]
  – Budesonide [Pulmicort Turbohaler Flunisolide [Aerobid]
  – Fluticasone Propionate (Flovent)
  – Triamcolone acetonide

• ORAL
  – Prednisone
  – Prednisolone

23 **Major Drugs for Asthma (4)**

• Anti-inflammatory Drugs (Contd.)
• Cromolyn and Nedocromil
  – Cromolyn inhaled [Intal]
  – Nedocromil inhaled [Tilade]

• Leukotriene Modifiers
  – Zafirlukast, oral [Accolate]
  – Zileuton, oral [Zyflo]
  – Montelukast, oral [Singulair]

24 **Adrenergic agonists**

• Most effective bronchodilator agents
• Primarily used via inhalation route
• Many different agents available
• Non-selective adrenergic agonists
  – Epinephrine
• Selective b-agonists
  – Isoproterenol
• Selective b2-agonists
  – Albuterol
– Metaproterenol
– Bitolterol
• Long-acting b2-agonists
  – salmeterol

25 | **Drug therapy : Bronchodilators**

Beta₂ agonists relax bronchial smooth muscle & are *used as first line therapy due to the rapid effect*....

Inhaled, PO, SC

  Inhalers have particular rapid effect
  *short acting inhaled used for rescue*
  Proventil, albuterol
  *long acting inhaled used for maintenance*
  serevent

PO preparations associated with greater systemic side effect
  terbutaline, proventil, repetabs
SC used in emergency management
  brethine, epinephrine

26 | **Nursing Considerations for Methylxanthines**

Used when other drug therapy is ineffective

PO, IV preparations
  theodur, aminophylline

requires loading dose on initiation

monitor therapeutic blood levels (5-15 mcg/ml)
  serum level > 20 mcg/ml is toxic
  Therefore - Narrow therapeutic margin

side effects include:
  restlessness, GI upset, tachycardia
  caffeine potentiates side effects
  Therefore - Poorly tolerated

27 | **Nursing Considerations for Anticholinergics**

• Inhaled preparation
  – atrovent (ipratropium)
• used infrequently as an *adjunct to rescue medication*
  – more often included in daily maintenance
• side effects:
  – dry mouth, headache, n/v, palpitations

28 | **Nursing Consideration with Anti-Inflammatories**

Corticosteroids / Glucocorticoids

• administered as PO, IV, Inhaled
  – Prednisone, Solumedrol, Beclomethasone
  – Side effects enhanced in PO and IV route
  – monitor for s/s of infection as it may be masked by medication
    • inhaled steroids may cause candidiasis
    – monitor for GI ulceration, impaired wound healing
– monitor for hyperglycemia
– monitor for weight gain, fluid retention

Goal - prevent permanent structural damage to lungs.

CORTICOSTEROIDS

• Are the most effective anti-asthma drugs available
• Administration is usually by inhalation, but may also be oral or IV.
• Adverse reactions to inhaled glucocorticoids are minor, as contrasted with systemic use.
• Effective in improving all indices of asthma control— frequency and severity of symptoms, airway caliber and bronchial reactivity.

CORTICOSTEROIDS

• Mechanism of Anti-Asthmatic Action
• Glucocorticoids reduce symptoms of asthma by suppressing inflammation
• Specific anti-inflammatory effects include: Decreased synthesis & release of inflammatory mediators; (e.g., prostaglandins, leukotrienes, histamine)
  Decreased infiltration & activity of inflammatory cells (e.g., eosinophils, leukocytes)
  Decreased edema of the airway mucosa secondary to a decrease in vascular permeability).

CORTICOSTEROIDS

• By suppressing inflammation, glucocorticosteroids reduce bronchial hyperreactivity.
• In addition to reducing inflammation, glucocorticosteroids decrease airway mucus production, increase the number of bronchial b2 receptors and their responsiveness to b2 agonists

• Corticosteroid safety and adverse effects
• Inhaled glucocorticosteroids are first line therapy for asthma.
• Highly effective, very safe.

• Oral glucocorticosteroids are reserved for patients with severe asthma.
• Because of their potential for toxicity, these drugs are prescribed only when symptoms cannot be controlled with safer medications (inhaled glucocorticoids, b2 agonists, theophylline).

Inhaled Corticosteroids

• Beclomethasone (Vanceril®)
• Initial agent, available since 1976
• Prodrug, metabolized to beclomethasone mono-propionate
• Budesonide (Pulmicort®)
• Most widely used agent in the world
• Nebulized form available
• Triamcinolone (Azmacort®)
• Flunisolide (AeroBid®)
• Fluticasone (Flovent®)
• Most potent agent
• Mometasone (Asmanex®)
Cromolyn & Nedocromil

- Prophylactic anti-inflammatory agents
- Less effective than inhaled corticosteroids
- Function as mast cell degranulation inhibitors
- Useful to prevent exercise-induced asthma
- Poorly absorbed orally, used via inhalation
- Cromolyn can also be used intranasally

Leukotriene Modifiers

- Leukotrienes are chemical factors released by cells that cause inflammation, bringing about bronchoconstriction as well as eosinophil infiltration, mucus production, and airway edema
- Leukotriene inhibitors first became available in 1996
  - the first new drugs for asthma in over 20 years

Leukotriene Modifiers

- 5-lipoxygenase inhibitor
  - Zileuton (Zyflo®)
- CAUTIONS
- Hepatic toxicity
- Drug interactions
- 4xday administration
- LTD4 receptor antagonists
  - Zafirlukast (Accolate®)
  - Montelukast (Singulair®)
- Leukotriene Pathway Inhibitors

Asthma Steps

- Step 1 Mild Intermittent
  - Long-Term Control No daily medication needed
  - Quick Relief Short-acting bronchodilator: inhaled "b2-agonists as needed for symptoms

Asthma Steps

- Step 2 Mild Persistent
  - Long-Term Control One daily medication: Anti-inflammatory: either inhaled corticosteroid (low doses) or cromolyn or nedocromil
  - Quick Relief Short-acting bronchodilator: inhaled "b2-agonists as needed for symptoms.

Asthma Steps

- Step 3 Moderate persistent
  - Long-Term Control Anti-inflammatory: inhaled corticosteroid (medium dose) or Inhaled corticosteroid (low-medium dose) and a long-acting bronchodilator (long-acting inhaled "b2-agonist, sustained-release theophylline or longacting "b2-agonist tablets)
  - Quick Relief Short-acting bronchodilator: inhaled "b2-agonists as needed for symptoms.

Asthma Steps

- Step 4 Severe persistent
  - Long-Term Control Anti-inflammatory: inhaled corticosteroid (high dose) and Long-acting bronchodilator (inhaled "b2-agonist, sustained-release theophylline or long-acting l2-agonist tablets) corticosteroid tablets or syrup
  - Quick Relief Short-acting bronchodilator: inhaled "b2-agonists as needed for symptoms.
**Nursing Consideration with Anti-inflammatories**
- Leukotriene inhibitors
  - PO preparation
    - Accolate (Zafirlukast) & Singular (Montelukast)
      - usually added to clients unresponsive to inhaled steroids
    - Zafirlukast side effects:
      - increased concentration if taken with Aspirin
      - impaired absorption with food
  - Tilade (Nedocromil)
    - inhaled therapy for maintenance only

**Nursing Considerations with Mast Cell Stabilizers**
- Cromolyn Sodium (Intal)
  - inhaled preparations
  - preventative therapy in allergic/environmental triggers
    - *take several weeks before allergy season*
  - requires consistent, regular use to be effective
    - *not used as a rescue drug*
  - causes throat irritation and coughing if powder is swallowed

**Nursing Considerations for Beta₂ Agonists**
- Monitor for s/s of toxicity especially with systemic preparations
  - palpitations, chest pain, hypertension
- Client teaching regarding use of short acting preparations as *rescue medication*

**Interventions for Asthma**
- Client Education
  - Self management
    - adjusting the frequency and dosage of prescribed drugs
    - peak flow meters
    - ↓PaCO₂ initially then PaCO₂ then later it may ↑
    - Status asthmaticus
  - Pharmacologic therapy
    - step category for severity and treatment (See Chart 33 – 2)
    - Anti-Inflammatory Agents
  - Exercise/Activity:
    - Regular exercise with aerobics are recommended
  - Oxygen

**Treatment for TB Disease**
- Principles of therapy
  - Induction phase
    - 4 drug therapy for 2 months
  - Continuation phase (after induction)
    - 2 drug therapy for 4 months

  Directly Observed Therapy (DOT) should be employed for suspected noncompliance....therefore strict adherence is a must!
  - Multiple drug regimens destroys the m/o quickly....
  - Reducing the emergence of MDR organisms!

**Drug-Drug Interactions**
• INH, RFB, PZA, EMB
  – Rifabutin is contraindicated with hard-gel saquinavir and delavirdine.
  – 20%-25% increase in the dose of PIs or NNRTIs might be necessary.
  – Patient should be monitored carefully for RFB drug toxicity (arthralgia, uveitis, leukopenia) if RFB is used concurrently with PIs or NNRTIs.
  – Evidence of decreased antiretroviral drug activity should be assessed periodically with HIV RNA levels.
  – No contraindication exists for the use of RFB with NRTIs.
  – RFB dosing may need to be increased or decreased with concurrent use of nelfinavir, indinavir, amprenavir, or ritonavir, or efavirenz. (protease inhibitors)

• Drug-Drug Interactions
• INH, SM, PZA, EMB
  – Can be used concurrently with antiretroviral regimens that include PIs, NRTIs, and NNRTIs.
• INH, RIF, PZA, EMB or SM
  – NRTIs may be administered concurrently with RIF.
  – If RIF is used with a client on antiretroviral therapy, the CDC site should be accessed to verify concurrent use of agents prior to administration

• OK Now what do I really need to know????????
  • Remember we want you to study these drugs as classes.
  • We want you to understand the nursing considerations regarding the classes of meds
  • If the med is on a case study or several.....

??????? Questions ????????