Allergy Immunotherapy in the Primary Care Setting

New York State College Health Association
2008 COMBINED ANNUAL MEETING

October 2008

Mary Madsen RN – BC
University of Rochester

Issues in Primary Care Practice

- Indications for allergy immunotherapy
- Mechanism of action
- Contraindications
- Administration in general practice setting
- Safety
- Treatment of anaphylaxis

Indications for Immunotherapy

Effective for:

- Allergic rhinoconjunctivitis
- Allergic asthma
- Venom allergy

Not indicated for:

- Atopic dermatitis
- Food allergy
- Chronic urticaria
- Angioedema

Allergic Rhinoconjunctivitis

- High disease burden-- 5-22% of population
- Medications often fail to control sx (in up to 40% of patients)
- AIT improves symptom score, reduces medication requirements
- Long term efficacy to minimize future medication usage
- Treatment in children may help prevent onset of asthma

AIT for Allergic Asthma

- Improves asthma symptoms
- Improves PFTs
- Protects against bronchial challenge
- Decreases medication requirements
- Benefit equal to inhaled steroids, but has advantage of long term efficacy

Stinging Insect Hypersensitivity

- Venom AIT effective for reducing risk of anaphylactic reactions
- Stings lead to life-threatening reactions in 0.4-0.8% of children and 3% of adults
- Estimated 40 deaths/year
- Large, local reactions to stings have not been shown to benefit from AIT

Mechanism of Action of AIT

- Shift from allergic T-lymphocyte (TH2) response to “non-allergic” TH1 response
- TH1 response causes increased production of IgG4 which blocks IgE
- Seasonal increase in IgE is blunted
- Increased IL-10 suppresses mast cells/eos

AIT Dosing

- Allergens for mixtures selected by testing
- Build-up phase
  - 1000-10,000 times less potent than maintenance dose
  - Frequency of injections and dosing advances depend on the patient and the protocol
- Maintenance phase
  - Final dose reached , and injections occur every 2-6 weeks
  - Clinical response can take 1 year
  - Duration of therapy from 3-5 years
- “Rush” or “cluster” schedules

Patient Selection for AIT

- Positive immediate hypersensitivity skin test results
- Serum-specific IgE test results
- Uncontrolled symptoms despite medications and avoidance of triggers
- Intolerance to medications
- Desire to avoid long term medications
- Systemic reactions after insect sting

Contraindications to AIT

- Medical conditions that reduce the patient's ability to survive a serious allergic reaction
  - Heart disease, beta blockers
- Poorly controlled asthma FEV1< 70%
- Patients who are unable to communicate clearly (children <5)
- AIT not initiated during pregnancy

Immunotherapy in General Practice

- The preferred location for administration is the prescribing physician's office, especially for high risk patients
- AIT should be initiated and monitored by an allergist
- Pts. may receive AIT at another health care facility **if the physician and the staff are equipped to recognize and manage systemic reactions**
- Full, clear, detailed immunotherapy schedule must be present
- Constant, uniform labeling system for extracts, dilutions and vials
- Procedures to avoid clerical/nursing errors (i.e. pt. photo ID) (file by DOB)

Review Health Status Before Injections

- Current asthma symptoms, ?measurement of PEF
- Current allergy symptoms and medication use
- New medications (beta blockers, ACE-I)
- Delayed reactions to previous injections
- Compliance with injection schedule
- New illness (fever), pregnancy
- Consultation with allergist as needed

Patient Responsibility

- Patient must wait 20-30 minutes in office
- Those with prior systemic or delayed reactions should wait longer
- Compliance with injection schedule
- Report any reactions to PCP and allergist
- Epi-Pen kits for self treatment

Immunotherapy Safety

- Incidence of fatalities has not changed much in the last 30 years in the US
- From 1990-2001 fatal reactions occurred at a rate of 1 per 2.5 million injections
- Average 3.4 deaths per year
- Most occur during maintenance phase or “rush”
- Poorly controlled asthmatics at greatest risk
- Many deaths associated with **a delay in administering epinephrine or not giving it at all**

Local Reactions Are Common

- Redness, swelling, warmth at site
- Large, local, delayed reactions do not predict the development of severe systemic reactions
- Local reactions don’t affect dosing schedule

Systemic Reactions

- Incidence of systemic reactions ranges from 0.05% to 3.2% per injection
- Risk factors include:
  - Dosing errors
  - Symptomatic asthma
  - High degree of allergy hypersensitivity
  - Use of beta blockers/ACE-I
  - New vials
  - Injections during the allergy season

Recognition of Systemic Reactions

- Most reactions occur in 20-30 minutes of vaccine
- Late phase (8-12 hrs) reactions possible
- Prompt recognition of potentially life threatening reactions by staff and patients
- Urticaria/angioedema are the most common initial symptoms--but they may be absent or delayed

Symptoms of Systemic Reactions

- Any allergic symptom that occurs at a location other than the site of the injection
  - Chest congestion or wheezing
  - Angioedema-swelling of lips,tongue, nose, or throat
  - Urticaria, itching, rash at any other site
  - Abdominal cramping, nausea, vomiting
  - Light-headedness, headache
  - Feeling of impending doom, decrease in level of consciousness

AIT in the PCP Office

- Preparedness plan in each office
- Prompt recognition of signs and symptoms of anaphylaxis
- Appropriate, aggressive treatment of systemic reactions
- If there is any doubt—give epinephrine!

Preparedness of the PCP Office

- Established medical protocols and treatment records posted
- Stock and maintain equipment/supplies
- Physicians and staff maintain “clinical proficiency” in anaphylaxis recognition and management
- Consideration of drills tailored to assess skills, response, and preparedness of office staff
- Tailor drill to consider access to local EMS-response times vary by location

Recommended Equipment

- Stethoscope, BP cuff
- Tourniquet, large bore IV needles, IV set-up
- Aqueous epinephrine 1:1000
- O2 and mask/nasal cannula
- Oral airway
- Diphenhydramine (oral and injection)
- Albuterol nebulized
- Glucagon
- ? IV corticosteroids
- ? IV Vasopressors
- ? AED

Initial Assessment of Anaphylaxis

- Level of consciousness
- Hemodynamic stability
- Oxygenation
- Upper and lower airway signs
- Cardiovascular system
- Skin
- GI symptoms
- Other sx possible

Immediate Intervention

- Assess ABC's
- **Administer epinephrine ASAP!** There is no contraindication
- Fatalities usually result from **delayed administration of epinephrine--with respiratory, and cardiovascular complications**
- Subsequent care based on response to epinephrine

Epinephrine

- 1:1000 dilution, 0.3 mg. dose administered IM or SQ q5 minutes as needed to control BP and other symptoms
  - Tourniquet above injection site
  - Pt can use their Epi-pen
- Effect of epi can be blunted by beta-blockers, with severe, prolonged sx including bronchospasm, bradycardia, and hypotension
- Glucagon can be used to reverse beta blockers

IM vs. SQ Epinephrine

- Both routes of injection appear in the literature
- IM injections into the thigh have been reported to provide more rapid absorption and higher plasma levels than IM or SQ injections into the arm.
- Studies directly comparing different routes have not been done

Interventions continued…

- Establish/maintain airway
- Give O2/check pulse ox
- IV access, hang IV fluids with NS
- Consider:
  - Diphenhydramine 25-50 mg. IM
  - Albuterol nebulized
  - Glucagon
  - Ranitidine, steroids—not helpful acutely
- Transfer to ED

Summary/Questions

- No mention of ACLS certification in literature, but staff and physicians must be able to demonstrate proficiency in protocols
- Preparedness drills may be helpful at each office
- Posting of protocols and treatment logs to minimize confusion
- Do we need ETT or AED?

The Future of AIT

- Being studied for food allergies, atopic dermatitis, and other, less standardized allergens (dog, mold)
- Investigational studies
  - high dose sublingual IT
  - Anti-IgE therapy (omalizumab) given with standard AIT
  - novel vaccine delivery systems

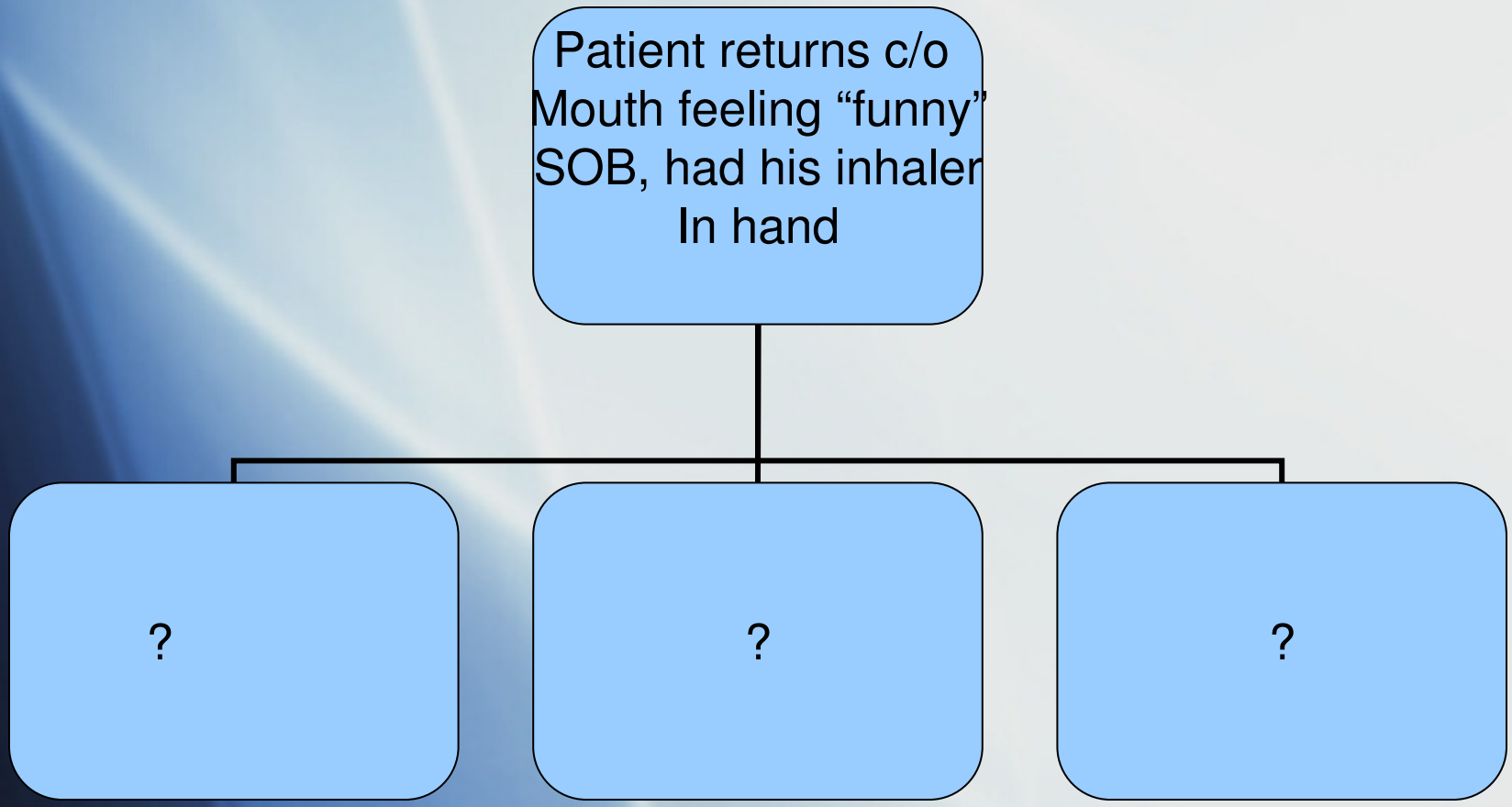
Increase administration safety

- Detailed instructions from allergist
- Develop own step by step process for giving injections
- Standardize forms to document injections
- Standardize treatment for systemic reaction
- Agreement form for student compliance
- All staff mock systemic reaction drill

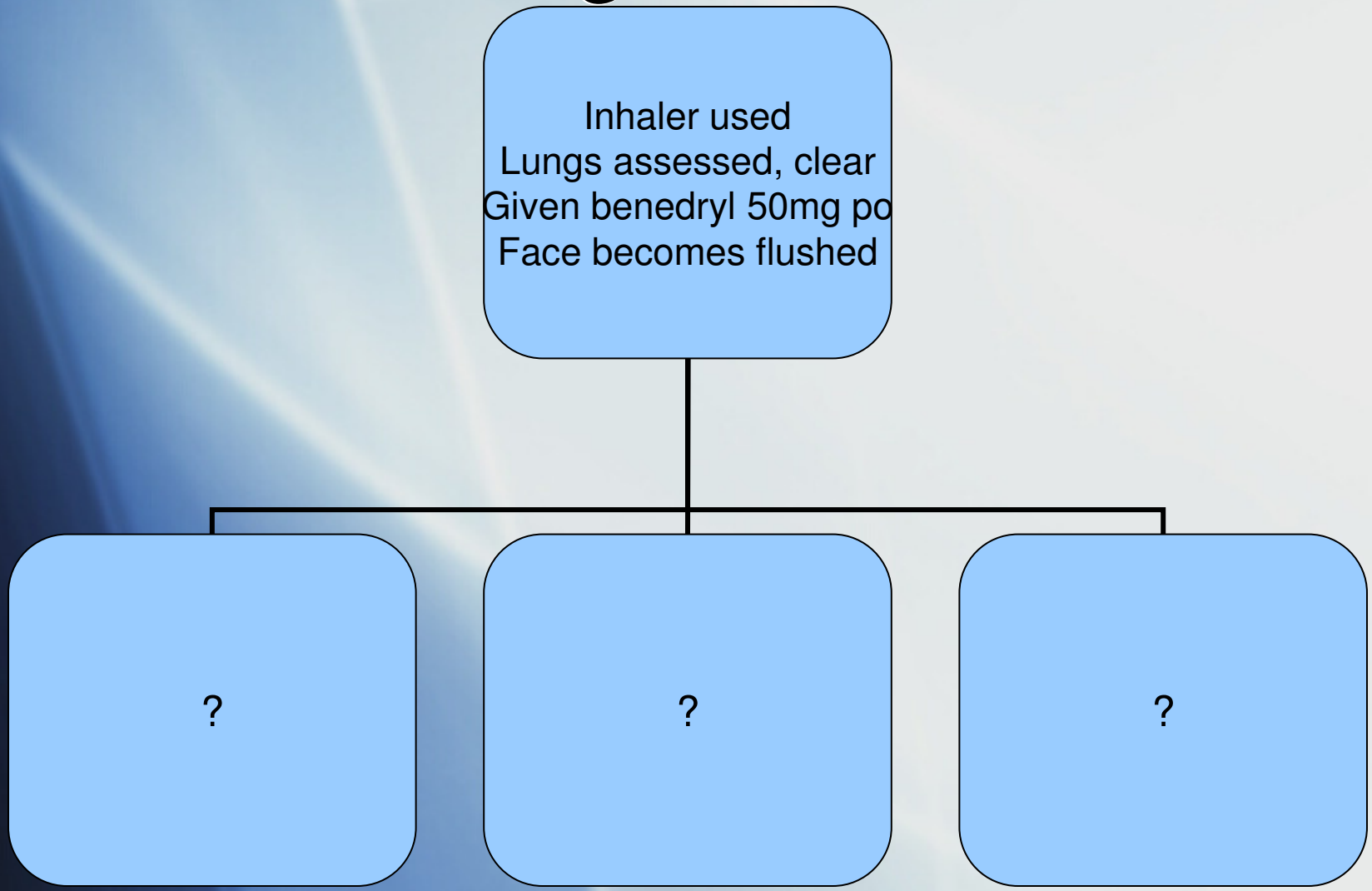
Patient History

20 yr old male PMH: ASTHMA Meds: Singular, Albuterol inhaler	Began injections 09/13/2005 Only one injection at allergist office 1. Trees, grass, weeds 2. Mites, cat, dog, mold	Per allergist instructions: Peak flow before and after injections Range: mid to high 600's	First late dose on 01/05/06
First hold for late reaction (> 24 hours) 03/02/2006 Dose given 0.10 Red 1/500 Peak flow: 720/ 730	Reduced due to late reaction 03/16/2006 Dose dropped to 0.1 (had received 0.2 on 03/09) Peak flow 690/ 750	c/o itching at site 03/30/06, next injection began needle change	04/14/2006 Systemic Reaction Peak flow before: 720

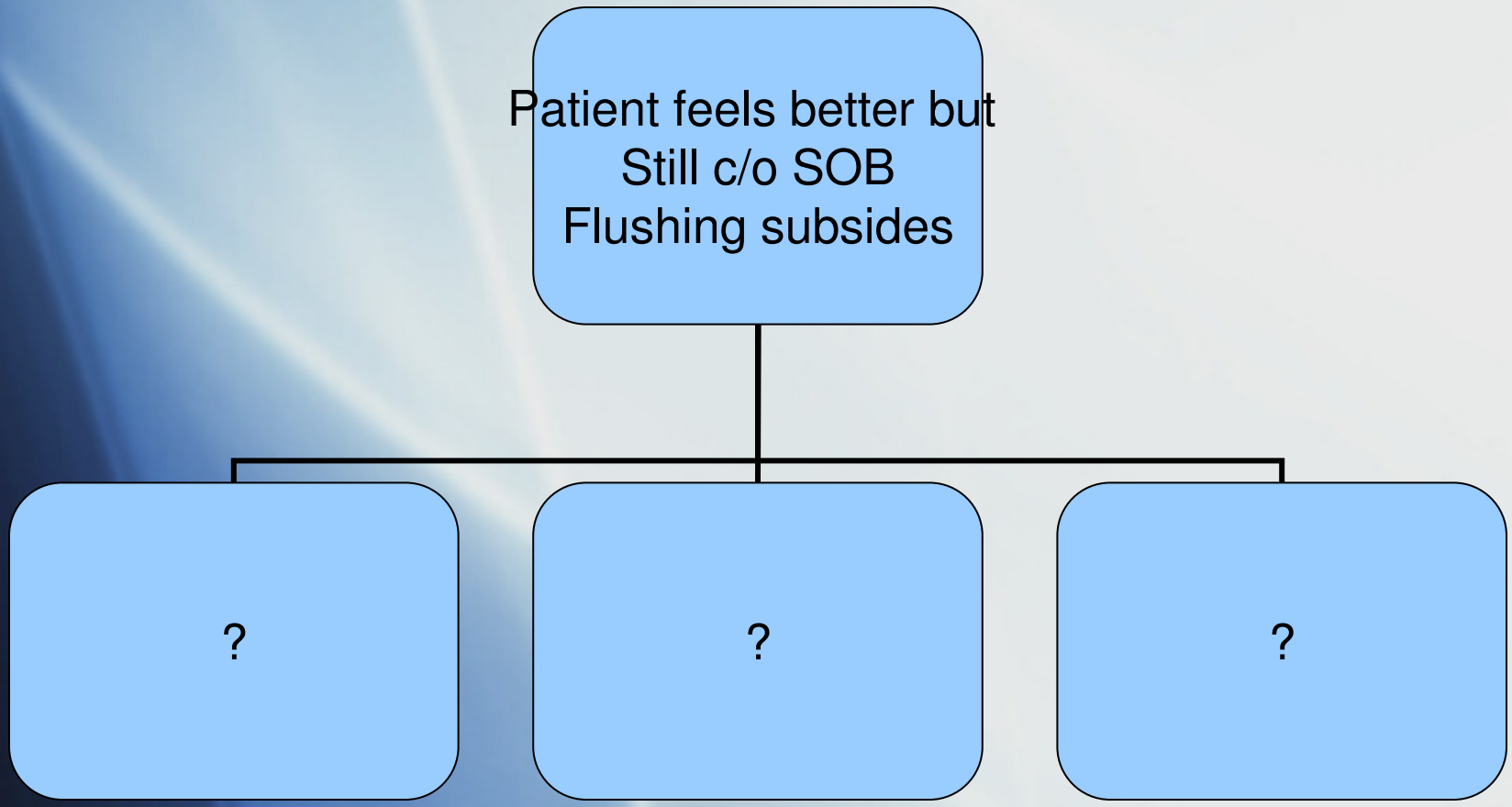
Allergy Injection given



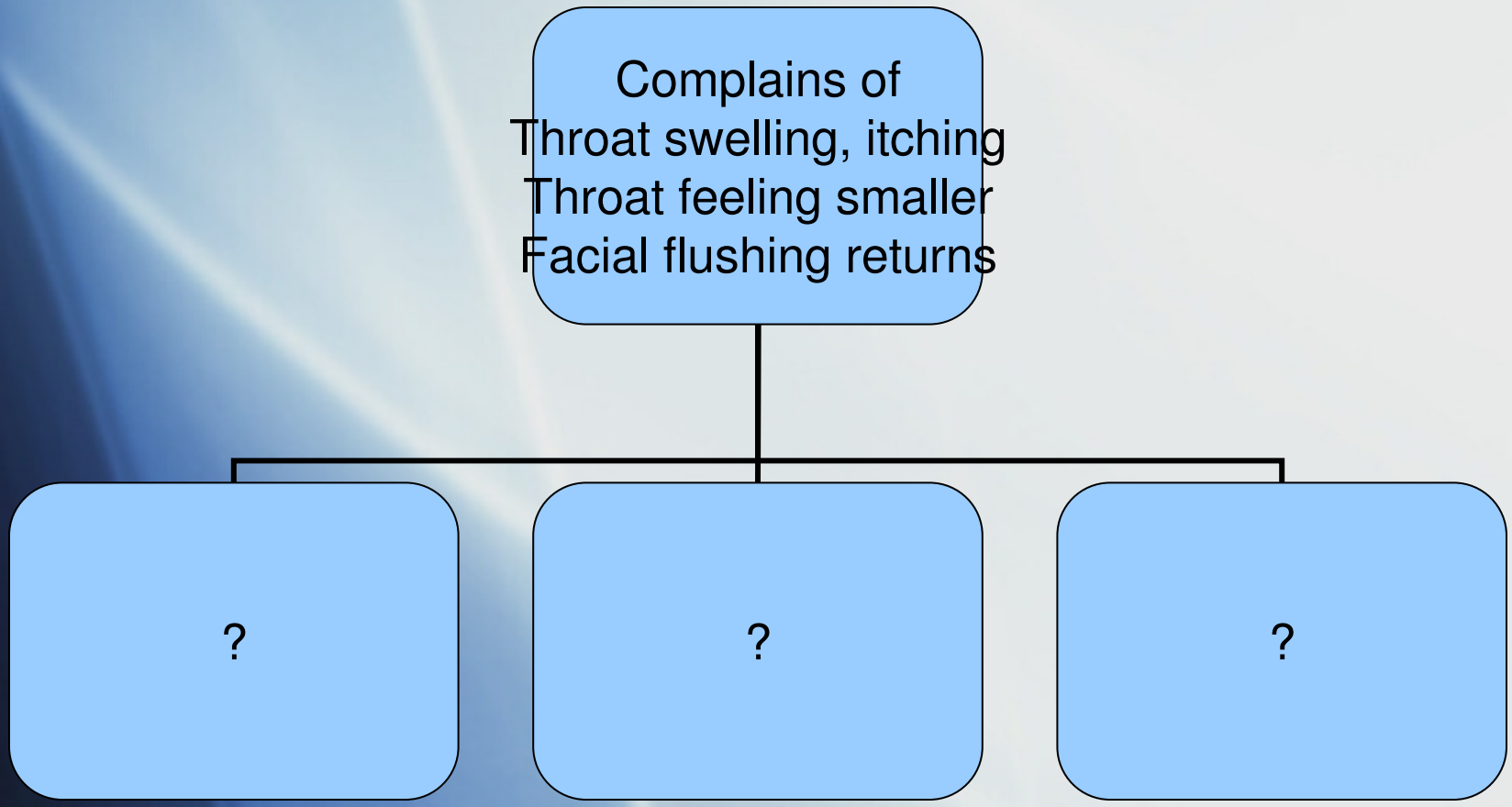
Patient brought to exam room



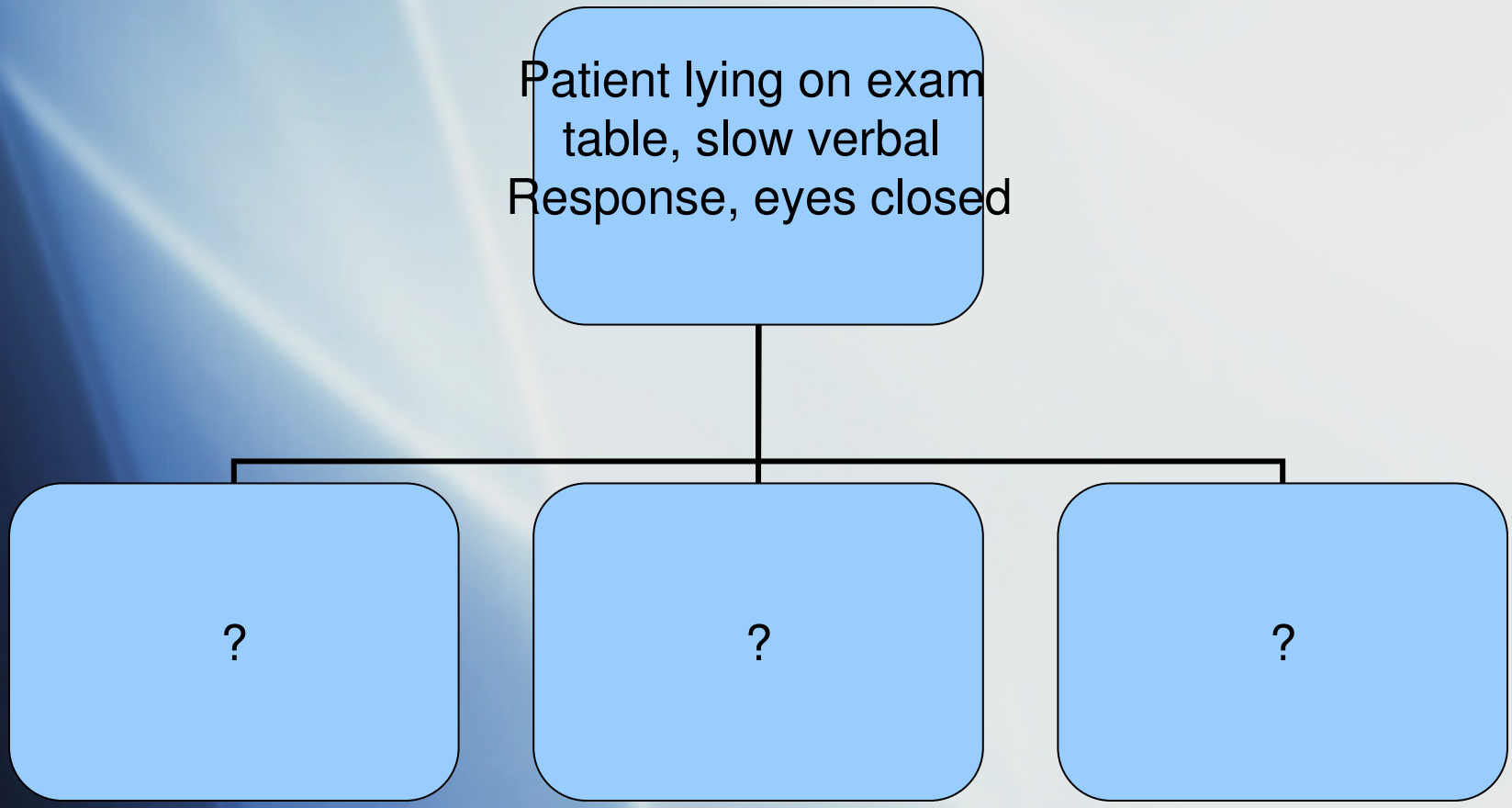
Epi 0.3 cc given left arm



Patient begins to feel “funny” again



Epi repeated



What we learned

- Treat with epi at first sign of reaction
- Documentation after incident was difficult
- Treatment protocol for sustained reaction
- Need for drill for all staff, including receptionist (responsible for calling for ambulance, 911/security)

References

- Position Statement on the Administration of Immunotherapy Outside of the Prescribing Allergist Facility, ACAAI, October 1997.
- Rank MA, Li JTC. Allergen Immunotherapy. *Mayo Clin Proc.* 2007;82(9):1119-1123.
- Stokes JR, Casale TB. Allergy Immunotherapy for Primary Care Physicians. *AJM.* 2006;119(10):820-823.
- Lieberman P, Kemp SF, Oppenheimer J, et al. The diagnosis and management of anaphylaxis:an updated practice parameter. *J Allergy Clin Immunology* 2005;115:S483-523.
- Li JT, Lockey IL, Bernstein JM, et al. Allergen immunotherapy: a practice parameter. *Ann Allergy, Asthma & Immunology.*2003;90:1-40.