Anaphylaxis and other adverse events
Aim:

To be able to manage anaphylaxis and other adverse events correctly
Learning outcomes

- Define local and systemic adverse events
- Distinguish between anaphylaxis and fainting
- Manage anaphylaxis
- Prepare and check the equipment and drugs used for managing anaphylaxis
- Define and recognise an adverse event
- Report an adverse event
Classification of Adverse Events Following Immunisation (AEFI)

- Vaccine-induced AEFI
  Induced direct effects of vaccine or vaccine component and/or due to underlying medical condition or idiosyncratic response in recipient

- Programmatic errors
  Incorrect doses or routes, wrong diluent

- Coincidental events
  Chance happening

- Injection reaction
  Result of injection itself, not the vaccine e.g. pain, anxiety

- Unknown
  Cause cannot be determined
Types of adverse event

• Local Reactions

More common with non-live vaccines containing adjuvants
(Pain, redness, swelling at injection site)

• Systemic Reactions

Generally more common following live vaccine, but less severe with subsequent doses (Fever, headache, loss of appetite)

• Allergic Reaction

Anaphylaxis/Severe systemic allergic reaction
Systems for monitoring/reporting AEFI

• Yellow card System

Passive reporting by doctor, pharmacist, nurse, patient or parent to the Medicine and Healthcare Products Regulatory Agency (MHRA)

http://medicines.mhra.gov.uk/

• Immunisation programme / public health agency

• Special schemes (specific condition)
  e.g.. British Paediatric Surveillance Unit (BPSU) in UK
What is anaphylaxis?

Definition of anaphylaxis

*Typically rapid and unpredictable with variable severity and clinical features including cardiovascular collapse, bronchospasm, angioedema, pulmonary oedema, loss of consciousness and urticaria*

• Potentially life threatening AEFI

• One of four types of hypersensitivity reactions

• Very rare - approx one per million vaccine doses

(Bohlke *et al.* Risk of Anaphylaxis After Vaccination of Children and Adolescents *Pediatrics* 2003; 112:815-820)
What happens during anaphylaxis

- Essentially an inappropriate immune response
- Occurs as a result of exposure to an allergen to which a person has been sensitised and previously made specific immunoglobulin E (IgE)
- Anaphylaxis can occur on re-exposure to the antigen when explosive amounts of histamine and other chemical mediators are released following the binding of the antigen to IgE coated mast cells.
Potential triggers

• Various common food and non food triggers
  (Nuts, shellfish, dairy products, wasp or bee stings, latex, antibiotics, anti-inflammatories)

• Vaccine specific

  *Egg proteins* (yellow fever and influenza vaccines)
  *Thiomersal* (some flu and hep B vaccines)
  *Antibiotics* (Neomycin streptomycin and polymixin B)
  *Toxoid* (DTaP, Td)
  *Stabilisers and other vaccine components* (Yeast, gelatin)
Distinguishing signs and symptoms of anaphylaxis and a faint:

In groups list the signs and symptoms of anaphylaxis and a faint

Cardiovascular system
Respiratory system
Gastrointestinal tract
Skin
Central nervous system
ABCDE

**Airway** – swelling of tongue, throat
Difficulty breathing
**Hoarse voice, stridor**

**Breathing** – shortness of breath
Increased respiratory rate
Wheeze
Hypoxia – confusion
Respiratory arrest
Circulation – Signs of shock
Pale, clammy, tachycardia, hypotension
Decreased conscious level
Cardiac arrest
Do not stand patient up
Disability – sense of impending doom

Anxiety, panic

Decreased conscious level

Exposure – skin changes in over 80%

Erythema / Uticaria

Includes mucosal changes - Angiodema
Signs & Symptoms

Mild

Flushed Appearance
Urticaria
Anxiety
Headache
Nausea
Abdominal pain
Signs & Symptoms

**Moderate**

Feeling of Impending Doom!
Swelling
Dyspnoea
Wheeze
Stridor
Tachycardia

Classic features of Moderate
Anaphylactic reaction
- Swelling of lips
- Urticaria
Signs & Symptoms

Severe
Angioedema (Including Pharyngeal/Laryngeal)
Hypotension
Cyanosis
Collapse
Respiratory or cardiac arrest
DEATH!!!
Management of anaphylaxis

- Call for assistance
- Lie patient down with legs raised (unless breathing difficulties)
- Where available administer oxygen (10-15 Litre/min)
- If showing clinical signs of shock, difficulty breathing or deteriorating consciousness administer intramuscular adrenaline into anterolateral aspect of thigh
- Repeat dose if no clinical improvement

<table>
<thead>
<tr>
<th>Age</th>
<th>Dose of adrenaline 1:1000 (1mg/ml)</th>
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</thead>
<tbody>
<tr>
<td>Less than 6 mths</td>
<td>0.15ml</td>
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<tr>
<td>6 months- 6 yrs</td>
<td>0.15ml</td>
</tr>
<tr>
<td>6-12 years</td>
<td>0.3ml</td>
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<tr>
<td>Over 12 years</td>
<td>0.5ml or 0.3ml (if small or prepubertal)</td>
</tr>
</tbody>
</table>
Minimum slide set created by:

Immunisation Department,
Centre for Infections,
Health Protection Agency

to assist teaching of the *Core Curriculum for Immunisation Training*
(see http://www.hpa.org.uk/infections/topics_az/vaccination/training_menu.htm)