PHARMACY BULLETIN

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The Comeback Killer : Diphtheria

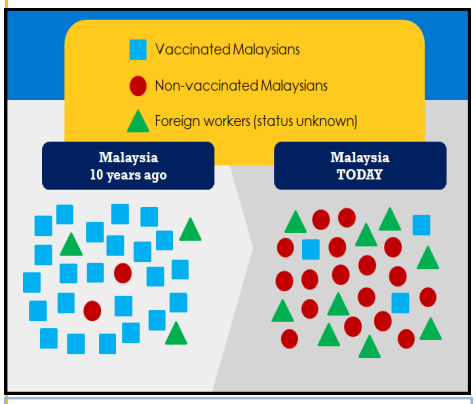
by PRP Isma & Ms Izyan

Diphtheria is caused by ***Corynebacterium diphtheriae***, a bacillus discovered in 1883 by Theodor Klebs and Friedrich Loffler who were investigating outbreaks described as malignant sore throat, croup and throat distemper (thick, leathery grey membrane in the throat). Diphtheria kills young children not only by suffocation , but also through the damage to the heart, kidney and nervous system. In the past, diphtheria was one of the common killer among children age 2-14 years old but since the first diphtheria vaccine developed in 1923 and adoption of preventive immunization, diphtheria has been essentially removed from the list of the common childhood diseases.

The DPT vaccine was the first vaccine introduced in the Malaysian Children's Immunization Programme in 1960s along with **BCG vaccine (1961), OPV vaccine (1972), measles (1984), rubella (1988) and Hepatitis B (1989).** Since the introduction of DPT vaccine 50 years ago, there is a **diminishing trend in incidence from 0.11 per 10,000 population in 1988 to 0.02 in 1998.** Furthermore, in the past 5 years, the highest number of diphtheria case was in 2013, where 4 cases including 2 deaths were recorded with an incidence rate of 0.01 per 100,000 population. However, recently the country was shocked by the death of 2 children due to diphtheria that occurred at Kedah and Malacca. The deadly disease that was once thought obsolete is now on the rise. As of 29th August 2016, there are **28 confirmed diphtheria** cases with 5 fatalities reported. **MAJORITY OF THE CASES DID NOT GET COMPLETE DOSE OF VACCINATIONS.**

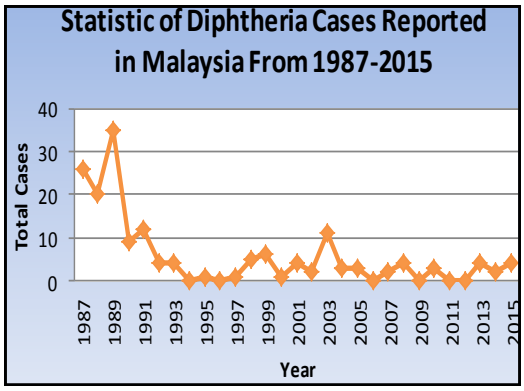
State	Cases	Death
Kedah	9	1
N.Sembilan	7	-
Sabah	5	3
Malacca	3	1
Penang	2	-
Selangor	1	-
Perak	1	-

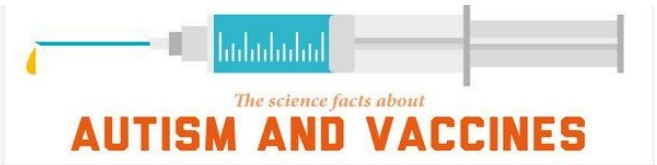
A complete dose of vaccination comprises of **4 jabs of the Diphtheria, Tetanus and Pertussis (DTP) vaccine**, provided FREE by the government during infant age at **2,3,5 and 18 months**. For children who missed or were never vaccinated with the DPT vaccine, they may get a **'catch-up' dose of DTP**. The immunization coverage of more than 95 per cent will serve as 'herd immunity' and protect the children from being infected with these bacteria. Children who received complete immunization will only suffer minor symptoms when being infected.

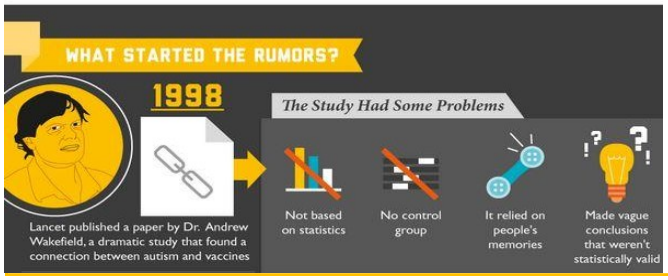


With more parents refusing vaccination, **herd immunity** WILL disappear.

According to Deputy Health Minister, Datuk Seri Dr Hilmi, more parents are refusing vaccinations for their children. In 2015 alone, **1,541 parents refused vaccinations** for their children. One survey showed, among the reasons parents refuse vaccination is unfounded fears that the vaccines contain porcine DNA and misconception that vaccines cause autism. In a study conducted in Kinta, Perak, it was found that the highest reason of immunization refusal by parents is due to preference for alternative treatment (homeopathy). This preference may stem from unsubstantiated information obtained from anti-vaccination movement that uses social network as medium to spread inaccurate information on vaccination.







In a nutshell, healthcare providers are encouraged to stay up to date on the recommended vaccines as well as understand the main concerns parents have about vaccinating their children. Understanding their concerns will equip pharmacists to speak with parents on a more relatable level in the areas parents value most. Healthcare providers play a crucial role in providing the public accurate information on vaccines and create awareness on the importance of ensuring children receive immunization jabs. Failing to do so will cause a rise in vaccine-preventable diseases, from diphtheria to measles, which is reflected in current scenario.

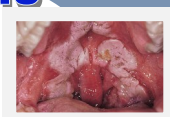
What is Diphtheria?

Diphtheria is caused by the bacterium *Corynebacterium diphtheria,* which primarily infects the throat and upper air-ways, and produce a toxin affecting other organs.

Mode Of Transmission

- Droplets
- From infected cutaneous lesions.
- Transmission by objects contaminated by nasopharyngeal secretions of patients

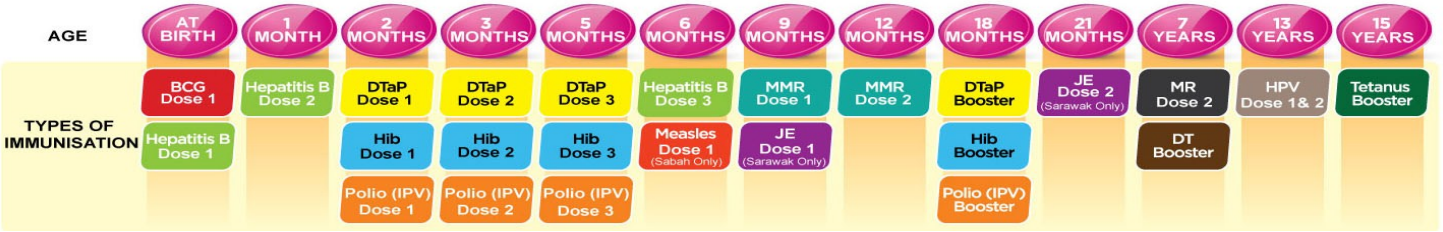
Sign & Symptoms



Usually begin **2-5 days (range from 1-10 days)** after a person become infected.

- Low grade fever, headache
- Malaise, edema of the neck ('bull neck')
- Sore throat or hoarseness
- Difficulty in breathing and painful in swallowing
- A bluish-whitish small patch on the tonsils

National Immunisation Schedule 2016



Ministry of Health brought forward the 1st dose of measles–mumps– rubella (MMR) vaccination to 9 months and second dose to 12 months, from the current 12 months and 7 years.

Treatment

Treatment	Dose (in units)	Notes
Antitoxin (made from horses) [Available in HKL]	• Nasal : IM 10,000 –20,000 U • Pharyngeal/laryngeal <48H : IM or IV 20,000-40,000 U • Combined types/delay diagnosis/nasopharyngeal : IV 40,000 - 60,000 U • Tonsillar : IM or IV 15,000-25,000 IU • Extensive disease of >3days, and/or severe swelling of neck (bull-neck) : IV or IM 80,000-100,000 U • Skin lesions only: 20,000-40,000 ** Pediatric dosing is same as adults.	•Repeated doses are NOT recommended as it may increase the risk of adverse reaction • Dilute antitoxin in 250 –500 mL of NS and administered over 2 –4 hours. Alternatively, may administer as IM in mild or moderate cases. • IV route is the preferred route of administration especially in severe cases. IM maybe given in mild to moderate cases. •Antitoxin should be warmed to 32-34°C before injection. Above than this the DAT proteins will denature. •As incidence of hypersensitivity to horse serum is high (10%), a test dose of antitoxin is required. • Antitoxin is injected 15-30 min after administration of pre-med (IV chlorpheniramine.).
Antibiotic	**PROPHYLAXIS** (for close contact*=defined as in contact with any laboratory confirmed case for 8 hours AND in close proximity within last 14 days from onset of illness.). • PO Erythromycin 40-50 mg/kg/day for 7 days, max 2g/day for adults, 1g/day for children OR • Single dose IM benzathine penicillin (<6yo or <30kg : 600,000 U) and (>6yo : 1,200,00 U) **TREATMENT** (PEDIATRIC) : IV or PO Erythromycin 40-50mg/kg/day, max 2g/day for 14 days **OR** IV Benzylpenicillin 100,000—150,000 units/kg/day in 4 divided doses (max of 1.2 MU**) OR** IM Procaine penicillin 25,000-50,000 U/kg/day (maximum 1.2 MU in 2 divided doses) followed by PO Pen V 125-250mg q6H for 14 days.	• The disease is usually not contagious 48 hours after antibiotics are instituted. Elimination of the organism should be documented by two consecutive negative cultures after therapy is completed.

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2) http://www.cdc.gov/diphtheria/downloads/protocol.pdf
3) Kansas Disease Investigation Guidelines Version 03/2009
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DRUG INFORMATION CENTRE, Pharmacy Department

MICHELLE TAN HWEE PHENG
IZYAN DIYANA IBRAHIM
hptan@ppukm.ukm.edu.my
izyandi@ppukm.ukm.edu.my
03-91455415/5401