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Infections – What is new and what is important?

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What am I going to talk about?

Imported infections

Meningitis – changes

Flu – vaccine issues

TB – NICE guidance changes

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Imported infections - Zika

Transmitted by the Aedes aegypti and Aedes albopictus mosquitoes (day time biting mosquitoes) – also transmit Dengue and Chikungunya

Declared a Public Health Emergency of International Concern on Feb 1st 2016 by WHO under the International Health Regulations Emergency Committee

Implicated in microcephaly and other congenital anomalies, and Guillain Barre syndrome

Passes from pregnant mother to the foetus and through sexual transfer

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Imported infections - Zika

Table 1. Countries and territories reporting mosquito-borne Zika virus transmission

Classification	WHO Regional Office	Country / territory	Total
Category 1: Countries with a first reported outbreak from 2015 onwards	**AFRO**	Cabo Verde; Guinea-Bissau	**2**
	AMRO/PAHO	Anguilla; Antigua and Barbuda; Argentina; Aruba; Bahamas; Barbados; Belize; Bolivia (Plurinational State of), Bonaire, Sint Eustatius and Saba – Netherlands*; Brazil; British Virgin Islands; Cayman Islands; Colombia; Costa Rica; Cuba; Curaçao; Dominica; Dominican Republic; Ecuador; El Salvador; French Guiana; Grenada; Guadeloupe; Guatemala; Guyana; Haiti; Honduras; Jamaica; Martinique; Mexico; Nicaragua; Panama; Paraguay; Peru; Puerto Rico; Saint Barthélemy; Saint Lucia; Saint Martin; Saint Vincent and the Grenadines; Sint Maarten; Suriname; Trinidad and Tobago; Turks and Caicos; United States of America; United States Virgin Islands; Venezuela (Bolivarian Republic of)	**46**
	WPRO	American Samoa; Fiji; Marshall Islands; Micronesia (Federated States of); Samoa; Singapore; Tonga	**7**
Subtotal			**55**
Category 2: Countries with possible endemic transmission or evidence of local mosquito-borne Zika infections in 2016	**SEARO**	Indonesia; Thailand	**2**
	WPRO	Philippines; Viet Nam	**2**
Subtotal			**4**
Category 3: Countries with evidence of local mosquito-borne Zika infections in or before 2015, but without documentation of cases in 2016, or outbreak terminated	**AFRO**	Gabon	**1**
	PAHO/AMRO	ISLA DE PASCUA – Chile**	**1**
	SEARO	Bangladesh; Maldives	**2**
	WPRO	Cambodia; Cook Islands**; French Polynesia**; Lao People's Democratic Republic; Malaysia; New Caledonia; Papua New Guinea; Solomon Islands; Vanuatu	**9**
Subtotal			**13**
Total			**72**

**This includes confirmed Zika virus cases reported in BONAIRE – Netherlands, SINT EUSTATIUS and SABA – Netherlands.*

***These countries and territories have not reported Zika virus cases in 2015 or 2016.*

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Imported infections - Zika

Table 3. Countries and territories reporting microcephaly and/or CNS malformation cases potentially associated with Zika virus infection

Reporting country or territory	Number of microcephaly and/or CNS malformation cases uggestive of congenital Zika infections or potentially associated with a Zika virus infection	Probable location of infection
Brazil	1845[3]	Brazil
Cabo Verde	9	Cabo Verde
Canada	1	Undetermined
Costa Rica	1	Costa Rica
Colombia	34[4]	Colombia
Dominican Republic	3	Dominican Republic
El Salvador	4	El Salvador
French Guiana	3[5]	French Guiana
French Polynesia	8	French Polynesia
Haiti	1	Haiti
Honduras	1	Honduras
Marshall Islands	1	Marshall Islands
Martinique	10[7]	Martinique
Panama	5	Panama
Paraguay	2[6]	Paraguay
Puerto Rico	1	Puerto Rico
Slovenia	1[7]	Brazil
Spain	2	Colombia, Venezuela (Bolivarian Republic of)
Suriname	1	Suriname
United States of America*	21[8]	Undetermined**

** US-CDC has modified the way information is displayed. To protect the privacy of the women and children affected by Zika, US-CDC is not reporting individual state, tribal, territorial or jurisdictional level data.*

***The probable locations of three of the infections were Brazil (1 case), Haiti (1 case) and Mexico, Belize or Guatemala (1 case).*

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Imported infections - Zika

Pregnant women and their male partners who are planning to travel

Country risk rating	Travel advice for pregnant women
High	Pregnant women should postpone non-essential travel until after pregnancy. All pregnant women planning to travel should seek advice from their healthcare provider 4 to 6 weeks before travel for an individual risk assessment
Moderate	Pregnant women should consider postponing non-essential travel until after pregnancy. All pregnant women planning to travel should seek advice from their healthcare provider 4 to 6 weeks before travel for an individual risk assessment
Low	No Zika specific advisory. All pregnant women planning to travel should seek advice from their healthcare provider 4 to 6 weeks before travel for an individual risk assessment and to discuss the low risk
Very low	No Zika specific advisory. All pregnant women planning to travel should seek advice from their healthcare provider 4 to 6 weeks before travel for an individual risk assessment

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Advice about prevention

An application of **insect repellent containing 50% DEET** will repel mosquitoes for approximately 10 hours if used as per instructions.

Repellents containing up to 50% DEET can be used by pregnant women, but higher concentrations should not be used.

When both sunscreen and DEET are required, DEET should be applied *after* the sunscreen. Sunscreen with a 30 to 50 SPF rating should be applied to compensate for DEET-induced reduction in SPF.

Zika – avoiding sexual transmission

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Women should be advised on the potential risks of Zika virus infection in pregnancy. Women should avoid becoming pregnant while travelling in an area with active Zika virus transmission, and for 8 weeks after their return.

For men:-

Condom usage for 8 weeks after return from an active Zika transmission area if he has not had any symptoms compatible with Zika virus infection

Condom usage for 6 months following the start of symptoms if a clinical illness compatible with Zika virus infection or laboratory confirmed Zika virus infection was reported

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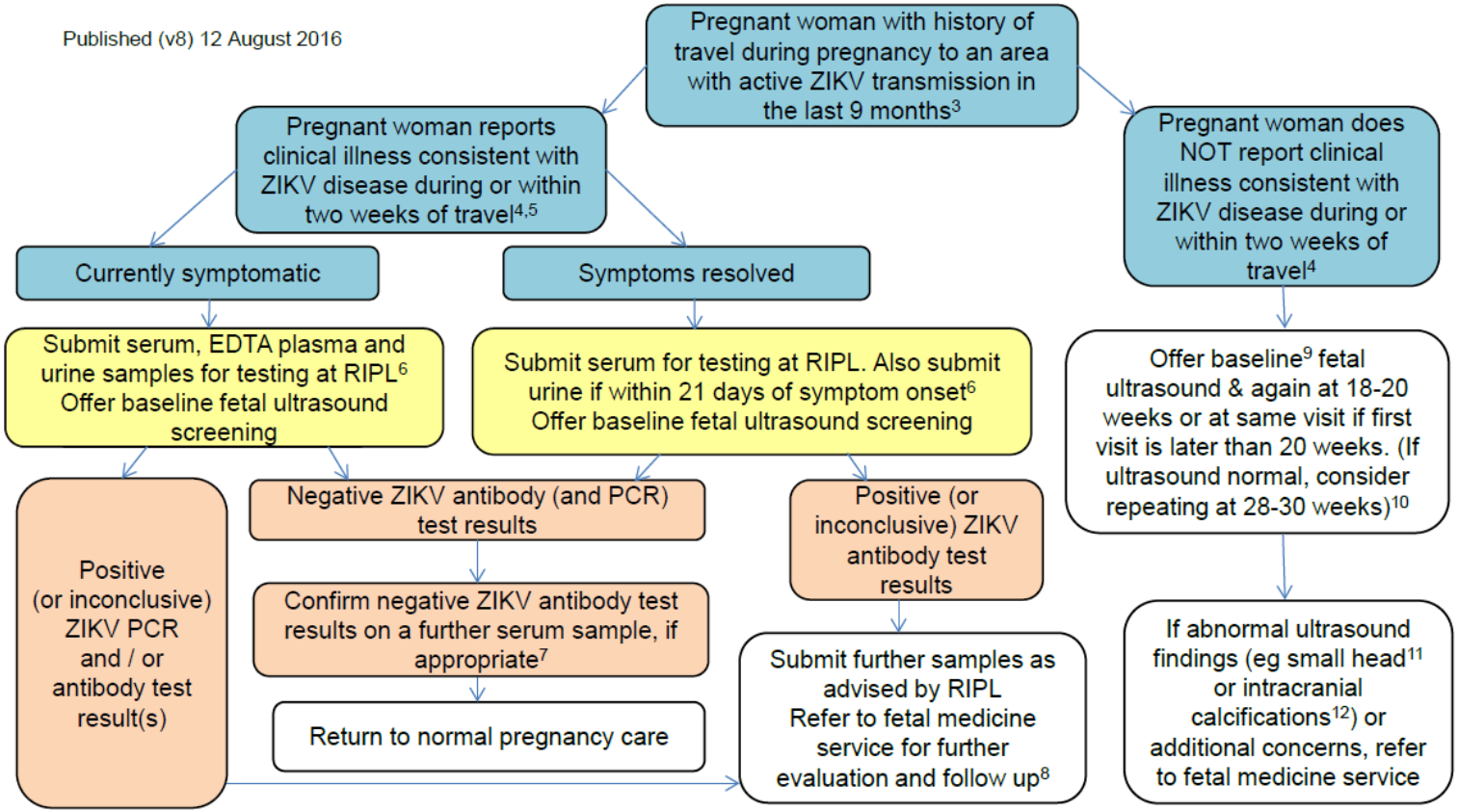
Assessing pregnant women

Revised algorithm[1] for assessing pregnant women with a history of travel during pregnancy to areas with active Zika virus (ZIKV) transmission[2]



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Region of travel for Zika cases diagnosed in UK travellers since 2015

Region of travel	Total
Caribbean	106
South America	33
Central America	11
Oceania	1
More than one region	5
Total	156

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MERS Co V

Middle Eastern Respiratory Syndrome Coronavirus

First reported in Saudi Arabia in 2012

Major outbreak in South Korea affecting hospitals

1589 lab confirmed cases causing 567 related deaths

Transmission continues in Saudi with a mixture of new primary cases and secondary cases

Advice re travel – avoid contact with camels, camel milk and camel products

Risk greatest to healthcare workers

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MERS Co V

As of 13:00 5 Sep 2016, there have been a total of:
1450 laboratory-confirmed cases of MERS-CoV infection, including:-
609 deaths [reported case fatality rate 42.0 per cent]
839 recoveries, and
2 currently active cases

It appears now as though there is low level, sporadic transmission ongoing mostly related to contact (direct or indirect) with camels.

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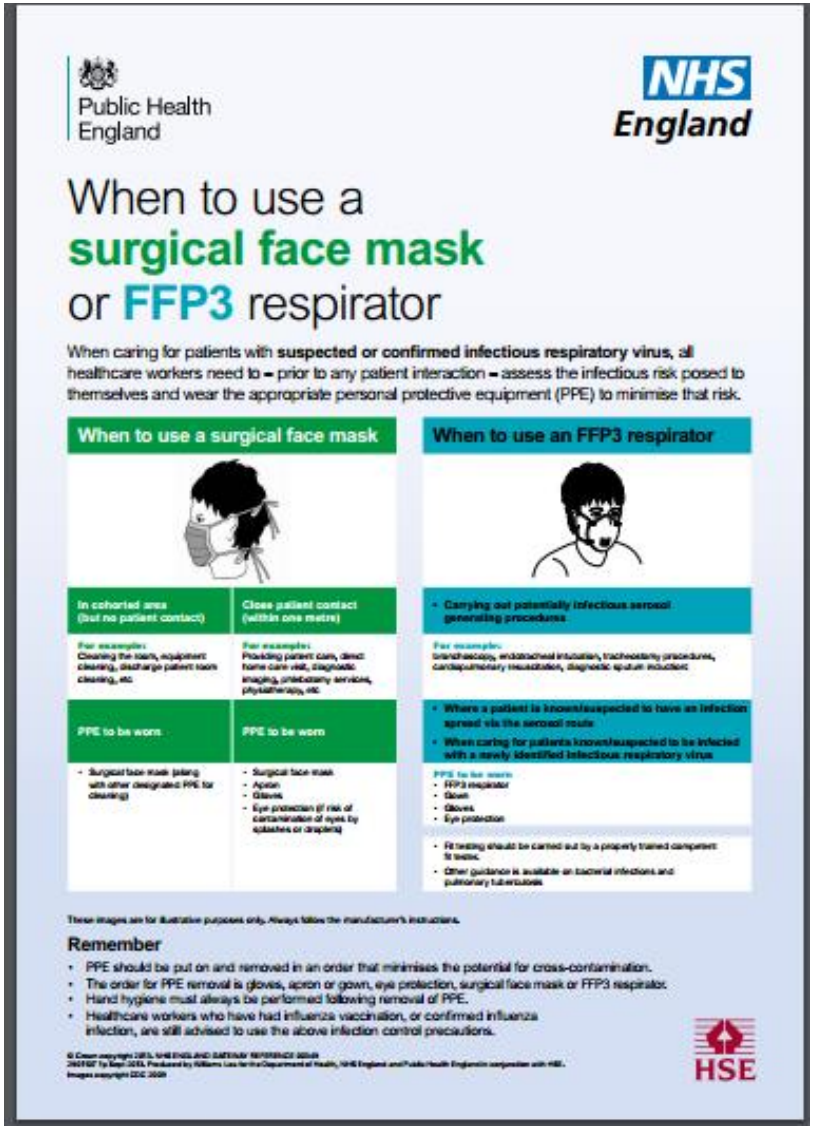
Face masks

https://www.england.nhs.uk/wp-content/uploads/2013/12/nhs-england-poster-v1.pdf



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NHS England

When to use a surgical face mask or FFP3 respirator

When caring for patients with **suspected or confirmed infectious respiratory virus**, all healthcare workers need to – prior to any patient interaction – assess the infectious risk posed to themselves and wear the appropriate personal protective equipment (PPE) to minimise that risk.

When to use a surgical face mask

In cohorted area (but no patient contact)

For example: Cleaning the room, equipment cleaning, discharge patient room cleaning, etc

PPE to be worn

- Surgical face mask (along with other designated PPE for cleaning)

Close patient contact (within one metre)

For example: Providing patient care, direct home care visit, diagnostic imaging, phlebotomy services, physiotherapy, etc

PPE to be worn

- Surgical face mask
- Apron
- Gloves
- Eye protection (if risk of contamination of eyes by splashes or droplets)

When to use an FFP3 respirator

- Carrying out potentially infectious aerosol generating procedures

For example: bronchoscopy, endotracheal intubation, tracheostomy procedures, cardiopulmonary resuscitation, diagnostic sputum induction

- Where a patient is known/suspected to have an infection spread via the aerosol route
- When caring for patients known/suspected to be infected with a newly identified infectious respiratory virus

PPE to be worn
- FFP3 respirator
- Gown
- Gloves
- Eye protection

- Fit testing should be carried out by a properly trained competent fit tester.
- Other guidance is available on bacterial infections and pulmonary tuberculosis

These images are for illustrative purposes only. Always follow the manufacturer's instructions.

Remember

- PPE should be put on and removed in an order that minimises the potential for cross-contamination.
- The order for PPE removal is gloves, apron or gown, eye protection, surgical face mask or FFP3 respirator.
- Hand hygiene must always be performed following removal of PPE.
- Healthcare workers who have had influenza vaccination, or confirmed influenza infection, are still advised to use the above infection control precautions.

HSE

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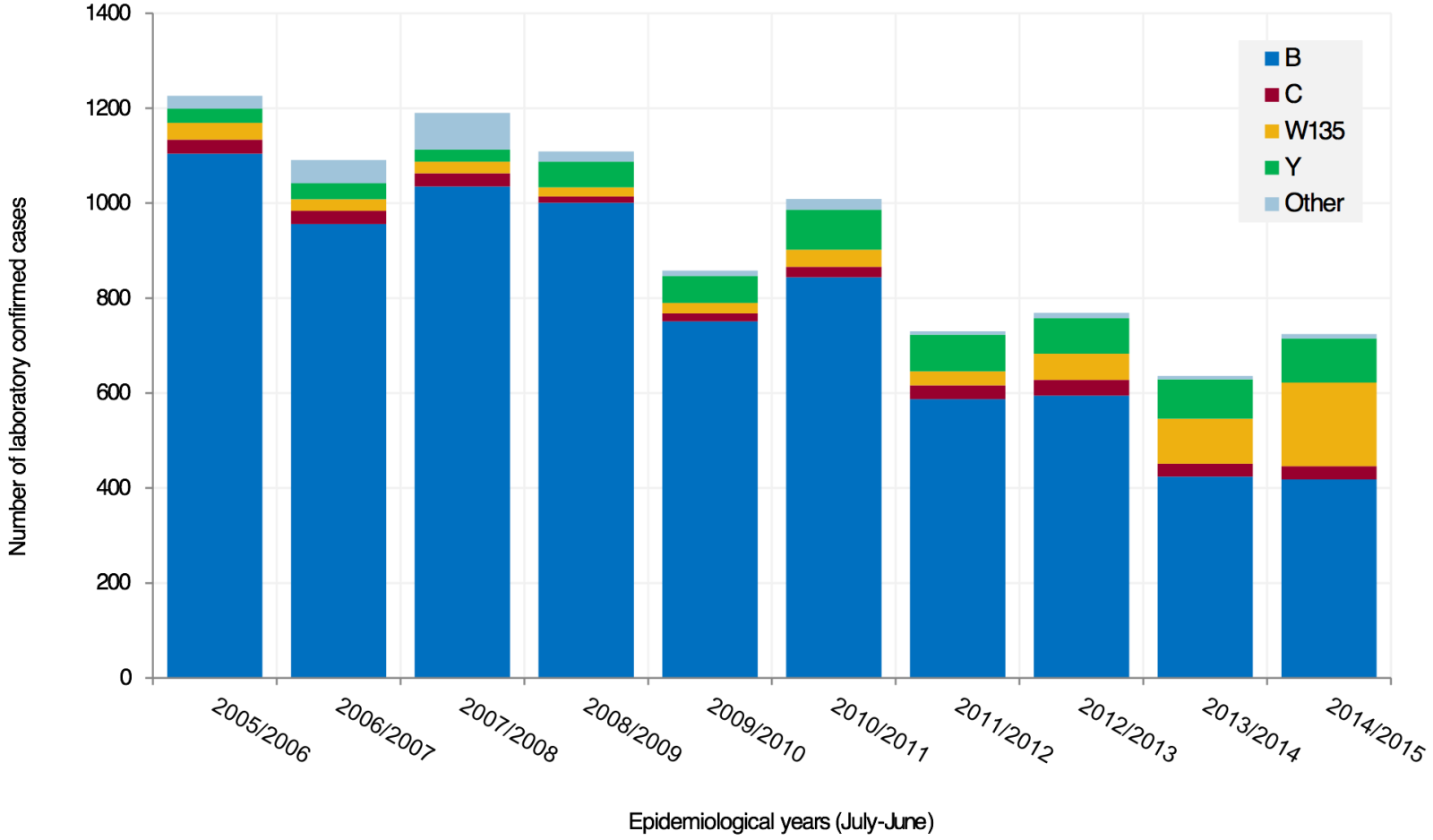
Meningitis

Laboratory confirmed cases of invasive meningococcal disease in England by capsular group, epidemiological years 2005/06 – 2014/15*



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Meningitis W increasing since 2009

Year	MenW
2009	23
2010	27
2011	33
2012	46
2013	78
2014	119

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Emergence of Meningitis W

- Increase associated with emergence of a specific virulent clone since 2008 (phenotyped as 2a:1.5,2)
- Incidence doubled in each of past two years
- Emerging strain is member of **ST-11 clonal complex**, associated with increase in disease incidence and high case fatality ratios in recent years
  - As group C, in UK and Europe in late 1990s
  - As group W, Hajj-associated outbreak early 2000s
  - As group W, African epidemics 2002-2004
  - As group W, in S. America and S. Africa
- Sequencing shows current strain is similar to that causing disease in South America

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Strategy to control Meningitis W

- Wide age range affected
  - Incidence highest in infants and adolescents
  - Still high number of cases in older adults

- Strategy in Chile of vaccinating children, only impacted on vaccinated age group
  - Failed to control overall disease rates

- Only feasible strategy is to target carriers with conjugate ACWY vaccine
  - plan to immunise adolescents
  - vaccinating older cohorts in catch up will accelerate control

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Flu vaccination – does it work?

Table: Influenza vaccine effectiveness against medically-attended laboratory confirmed influenza (A&B), by age group. UK multicentre case control study, provisional end of season results influenza season 2015-16 (1 October 2015 to 1 May 2016)

Population	N	Cases: unvac; vaccinated	Controls: unvac; vaccinated	Adjusted VE by scheme, age, month, gender (CI**)
All ages	3841	990; 165	1959; 727	52.4% (41, 61.6)
2-17 years*	729	212; 26	402; 89	57.6% (25.1, 76)
18-44 years	1551	486;43	862;160	55.3% (34.2, 69.6)
45-64 years	908	223;49	432;204	55.4% (34.6, 69.5)
65+ years	409	24;39	105;241	29.1% (-31.4, 61.8)

* LAIV Live attenuated influenza vaccine only ** CI 95% Confidence Interval

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Professional statements

GMC – Good Medical Practice

29. You should be immunised against common serious communicable diseases (unless otherwise contraindicated).

Nurses code of practice

19.4 take all reasonable personal precautions necessary to avoid any potential health risks to colleagues, people receiving care and the public.

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Egg content of flu vaccines

Influenza vaccines for the 2016/17 influenza season

Supplier	Name of product	Vaccine Type	Age indications	Ovalbumin content µg/ml (µg/dose)	Contact details
AstraZeneca UK Ltd	Fluenz Tetra ▼	Live attenuated, nasal	From 24 months to less than 18 years of age	≤1.2 (≤0.24/0.2ml dose)	Fluenz Tetra® for use in the national children flu programme should be ordered through ImmForm** Otherwise: 0845 139 0000
GSK	Fluarix™ Tetra ▼	Split virion inactivated virus	From 3 years	≤0.1 (≤0.05/0.5ml dose)	0800 221 441
MASTA	Imuvac®	Surface antigen, inactivated virus	From 6 months	0.2 (0.1/0.5ml dose)	0113 238 7552
	Inactivated Influenza Vaccine (Split Virion) BP	Split virion, inactivated virus	From 6 months	≤0.1 (≤0.05/0.5ml dose)	
Mylan (BGP Products)	Influvac®	Surface antigen, inactivated virus	From 6 months	0.2 (0.1/0.5ml dose)	0800 358 7468
	Imuvac®	Surface antigen, inactivated virus	From 6 months	0.2 (0.1/0.5ml dose)	
	Influenza vaccine, surface antigen, inactivated	Surface antigen, inactivated virus	From 6 months	0.2 (0.1/0.5ml dose)	
Pfizer Vaccines	Influenza vaccine (split virion, inactivated), pre-filled syringe	Split virion, inactivated virus	From 5 years	≤2 (≤1/0.5ml dose)	0800 089 4033
	Enzira®	Split virion Inactivated virus	From 5 years	≤2 (≤1/0.5ml dose)	
Sanofi Pasteur MSD	Inactivated Influenza Vaccine (Split Virion) BP	Split virion, inactivated virus	From 6 months	≤0.1 (≤0.05/0.5ml dose)	0800 085 5511
	Intanza® 15 micrograms	Split virion, inactivated virus	60 years of age and over	≤0.24 (≤0.024/0.1ml dose)	
Seqirus Vaccines Ltd, formerly Novartis Vaccines	Agrippal®	Surface antigen, inactivated virus	From 6 months	≤0.4 (≤0.2/0.5mL dose)	08457 451 500

** In England, this vaccine should be ordered online via the ImmForm website: portal.immform.dh.gov.uk

Note, the ovalbumin content is provided in units of µg/ml and µg/dose.

None of the influenza vaccines for the 2016/17 season contain thiomersal as an added preservative.

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TB - new NICE Guidance

BCG

Offer BCG vaccination to healthcare workers and other NHS employees who have contact with patients or clinical specimens, irrespective of age, who:

- are previously unvaccinated (that is, without adequate documentation or a BCG scar)

and

- are Mantoux - or interferon-gamma release assay negative

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TB NICE Guidance

If a prospective or current healthcare worker who is Mantoux- (or interferon-gamma release assay-) negative declines BCG vaccination, explain the risks and supplement the oral explanation with written advice. If the person still declines BCG vaccination, he or she should not work where there is a risk of exposure to TB. The employer will need to consider each case individually, taking account of employment and health and safety obligations.

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UK Born people

Offer a Mantoux test to new NHS employees who will be in contact with patients or clinical materials, if the employees: are not new entrants from high-incidence countries and have not had BCG vaccination (for example, they are without a BCG scar, other documentation or a reliable history).

If the Mantoux test is positive, offer an interferon-gamma release assay. If this is positive, assess for active TB; if this assessment is negative, offer them treatment for latent TB infection.

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New entrants

Offer a Mantoux test to new NHS employees who are from a high-incidence country. (defined in the NICE guidance as – 40 / 100000 whereas the New Entrant Programme is 150/100,000 and sub-Saharan Africa)

If the Mantoux test is positive (5 mm or larger, regardless of BCG history), assess for active TB; if this assessment is negative, offer them treatment for latent TB infection.

If Mantoux testing is unavailable, offer an interferon-gamma release assay. (new recommendation)

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Development of LTBI

Approximately 30% of people exposed to TB will develop LTBI

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Outcomes of LTBI are heterogeneous

- This includes individuals whose immunologic response is insufficient and who progress to primary active disease;
- people who have subclinical disease;
- people who initially contain infection but later progress to active TB disease;
- people who maintain persistent, life-long asymptomatic infection;
- people who may effectively clear infection by generating especially effective immune responses.

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Epidemiological factors associated with progressions to active disease

- recent infection (eg, contacts of persons with active TB)
- HIV co-infection (the greatest risk factor for progression to active TB disease),
- lack of understanding and tools to predict who will and who will not progress from LTBI to active TB.

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Positive IGRA or Mantoux

Poor predictor of progression to active disease

5 – 10% of people with LTBI will progress thus the vast majority of people who are immuno-competent do not progress

All tests have poor predictive value in showing who will progress

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Harm from using IGRAs as a screening tool

Extensive testing for LTBI is misguided when it involves testing low-risk individuals because of guidance and Health and Safety legislation that has not kept up with the changing epidemiology of TB.

Unlike countries with high TB burden, the vast majority of health care workers are not at increased risk for occupationally acquired TB infection. However, tens or hundreds of thousands of low-risk US health care workers are required to undergo yearly testing for LTBI. This results in high rates of false-positive test results

Dorman SE, Belknap R, Graviss EA, et al; Tuberculosis Epidemiologic Studies Consortium. Interferon-γ release assays and tuberculin skin testing for diagnosis of latent tuberculosis infection in healthcare workers in the United States. Am J Respir Crit Care Med. 2014;189(1):77-87.

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Benefits and Harm

100 000 asymptomatic adults at increased risk for tuberculosis (eg, persons born in, or former residents of, high-prevalence countries) screened, 52 to 146 active tuberculosis cases would be prevented

7 to 67 cases of hepatotoxicity would occur (depending on type of treatment)

111 persons would discontinue treatment because of adverse events.

The number needed to treat to prevent 1 case of LTBI from progressing to active tuberculosis would range from 111 to 314 (depending on the patient's risk for progression)

the number needed to treat to cause 1 case of hepatotoxicity from treatment would range from 279 to 2531 (depending on type of treatment).