

# Immunisation guidance for adult cancer patients receiving cytotoxic chemotherapy

(excludes allogeneic transplant patients)

## Summary

- Influenza vaccination is recommended for patients treated with immunosuppressive chemotherapy during the 'flu season (October to March).
- Pneumococcal vaccination is recommended for patients planned for immunosuppressive chemotherapy, if not previously vaccinated against pneumococcus (irrespective of season).
- Catch-up vaccinations to match UK immunisation schedule are recommended for patients planned for cytotoxic chemotherapy.
- Live vaccinations should be avoided during cytotoxic chemotherapy, and subsequently, if immunosuppression continues. Also avoid in patients on steroids for > 1 week.
- Shingles vaccination programme is available for patients aged 70 – 79, but is a live vaccine and therefore contra-indicated in patients receiving immunosuppressive therapy.
- Close household contacts and carers of patients on chemotherapy should receive routine immunisations (including live vaccines), and varicella and influenza immunisations should also be considered (see below for details)
- Please refer to the Green Book of immunisations and the relevant Summary of Product Characteristics for further information.

## Annual Influenza vaccination

- Inactivated influenza vaccination\* is safe, inexpensive and indicated for patients receiving chemotherapy during the 'flu season (October to March)  
\*The live influenza vaccine (Fluenz Tetra®) – which is a nasal spray - is not recommended in this patient group.
- Influenza vaccination should be offered to patients undergoing immunosuppressive chemotherapy (including those planned for autograft), and to patients with multiple myeloma. It is also recommended for individuals treated with, or likely to be treated with, systemic steroids for more than a month at a dose equivalent to prednisolone  $\geq 20$ mg per day.
- If a patient is planned for chemotherapy during 'flu season but not within next two weeks:
  - Recommend vaccination at GP surgery (vaccination > 2 weeks pre-chemotherapy ensures maximal response)
- If a patient is planned for chemotherapy during 'flu season and within next two weeks, do not delay chemotherapy
  - Recommend vaccination at GP surgery at earliest opportunity before or during chemotherapy.
  - If vaccinating during cyclical chemotherapy, the optimal timing of the vaccine in relation to chemotherapy in order to achieve the best possible immune response to the vaccine is not known. Sensible advice is for the vaccine to be administered when the patients are not neutropenic:  
recommend vaccination 2 – 4 days before the next chemotherapy cycle is due (or, if that is not possible, within 72 hours following chemotherapy)
  - Patients on continuous oral biologic targeted therapy or chemotherapy can continue therapy without interruption for vaccination

Reason for update: N/A	Approved by Chair of Alliance Chemotherapy Group:: Dr J De Vos
Version: 1	Date: 21.3.16
Prepared by: S Taylor and Dr F Saleh	Checked by: Nicki Lewis (Lead antimicrobial pharmacist, RSCH)

## Pneumococcal vaccination

- *If not previously vaccinated against pneumococcus*, pneumococcal vaccination is recommended for all patients planned for immunosuppressive chemotherapy (including those planned for autograft), and for multiple myeloma patients. Also recommended for individuals on, or likely to be on, systemic steroids for more than a month at a dose equivalent to prednisolone  $\geq 20$ mg per day.
  - PPV23 vaccine is relatively ineffective in patients with multiple myeloma, Hodgkin's and non-Hodgkin's lymphoma (especially during treatment).
  - PCV13 is only recommended for severely immunocompromised cancer patients (see below).
- a) Pneumococcal vaccination schedule for patients starting immunosuppressive chemotherapy, except for patients with leukaemia or myeloma, or bone marrow transplant patients:**
- A single dose of the pneumococcal polysaccharide vaccine (PPV23) should be administered.
  - Ideally, administer 4 – 6 weeks before chemotherapy starts. Where this is not possible, it can be given up to 2 weeks before chemotherapy starts.  
If this is not possible, immunisation can be delayed until at least three months after completion of chemotherapy in order to maximise the response to the vaccine. Immunisation of these patients should not be delayed if this is likely to result in a failure to vaccinate.
- b) Pneumococcal vaccination schedule for severely immunocompromised cancer patients, i.e. bone marrow transplant patients, patients with acute or chronic leukaemia, or multiple myeloma:**
- A single dose of the pneumococcal conjugate vaccine (PCV13) should be administered, followed by PPV23 at least two months later.
  - For leukaemia patients, PCV13 should be given from six months after completion of chemotherapy, and for bone marrow transplant patients, PCV13 should be offered 9-12 months following transplantation.
  - Severely immunocompromised patients who have already received PPV23 should be offered PCV13 with an interval of at least six months following the dose of PPV23, to reduce the risk of pneumococcal serotype-specific hypo-responsiveness.

## Shingles vaccination (herpes zoster, Zostavax®)

- The shingles vaccination programme is available for patients aged 70 – 79.
- Eligible individuals (aged 70 -79) who have not received zoster vaccine **and have no contra-indications** should, if timing allows, receive a single dose of the vaccine at the earliest opportunity and at least 14 days before starting immunosuppressive therapy, although leaving one month before starting would be preferable if a delay is possible.
- However, this vaccine is live and therefore **contra-indicated** in many patients with malignancy, including:
  - any patient on immunosuppressive chemotherapy
  - patients with acute leukaemias or lymphoma (including Hodgkin's lymphoma)
  - any patient with a chronic lymphoproliferative malignancy e.g. indolent lymphoma, CLL, myeloma or other plasma cell dyscrasia, whether or not they are receiving any treatment.
  - those who have received immunosuppressive chemotherapy or radiotherapy in the last 6 months
  - those who have received biological therapies such as rituximab, alemtuzumab, ofatumumab, obinutuzumab within the last 12 months.
  - those who have received a stem cell transplant in the last 24 months (and after that only with specialist advice)

Reason for update: N/A	Approved by Chair of Alliance Chemotherapy Group:: Dr J De Vos
Version: 1	Date: 21.3.16
Prepared by: S Taylor and Dr F Saleh	Checked by: Nicki Lewis (Lead antimicrobial pharmacist, RSCH)

- those who are receiving or have received in the past 3 months short term high-dose corticosteroids (>40mg prednisolone per day for more than 1 week) or long term lower dose corticosteroids (>20mg prednisolone per day for more than 14 days)
- those who are receiving or have received in the past 3 months, non-biological oral immune modulating drugs e.g. methotrexate >25mg per week, azathioprine >3.0mg/kg/day or 6-mercaptopurine >1.5mg/kg/day

N.B. Eligible patients who have an absent or dysfunctional spleen should be offered Zostavax®, **unless otherwise contraindicated.**

### Vaccination of close contacts of patients undergoing immunosuppressive chemotherapy

- Patients should be reassured that household contacts of the patient receiving chemotherapy can receive both inactivated or live vaccines at any time, without risk to the patient; instead, these offer a protective role.
- Influenza vaccine should be offered to all close family contacts from 6 months of age, as well as carers.
- If the patient has no definite history of chickenpox **and** negative VSV serology, varicella zoster (chickenpox) vaccine is recommended for:
  - unavoidable close contacts / children aged < 16 with no definite history of chickenpox
  - unavoidable close contacts aged ≥ 16 with no definite history of chickenpox **and** negative VZV serology.

### Catch-up vaccinations

- Catch-up vaccinations to align with the current UK immunisation schedule are recommended for patients: <https://www.gov.uk/government/publications/the-complete-routine-immunisation-schedule>
- These should preferably be completed at least two weeks prior to chemotherapy to ensure optimal response.
- Non-live vaccinations can be given during chemotherapy if immediate protection is required (*avoid period of predicted neutropenia*), though these should be repeated after completion of chemotherapy to ensure effective long-term protection.
- Avoid administering live vaccines less than two weeks before, during and for 6 months after completion of chemotherapy, and indefinitely if persistent immunosuppression following treatment. Also avoid in patients treated with steroids (40mg prednisolone per day or equivalent) for > 1 week within the last 3 months.

### General vaccination advice

- All vaccinations should be given via the GP surgery
- Where possible avoid vaccinations during the period of neutropenia (neutrophil count < 1.0 x 10<sup>9</sup>/L)
- Avoid intramuscular injections if platelet count < 50 x 10<sup>9</sup>/l
- Vaccines given during chemotherapy should be discounted when considering number of doses required for long-term protection

### References:

Department of Health, "The Green Book" online accessed via <https://www.gov.uk/government/collections/immunisation-against-infectious-disease-the-green-book#the-green-book>  
<http://www.uptodate.com/contents/immunizations-in-patients-with-cancer#H9>  
 Kotton and Poznansky, Oncologist 2012; 17 (1): 1 – 2  
 PHE Vaccination against shingles: 2015/16, Information for healthcare professionals online via: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/466913/PHE\\_Shingles\\_advice\\_for\\_health\\_professionals\\_October\\_2015-16\\_.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/466913/PHE_Shingles_advice_for_health_professionals_October_2015-16_.pdf)

Reason for update: N/A	Approved by Chair of Alliance Chemotherapy Group:: Dr J De Vos
Version: 1	Date: 21.3.16
Prepared by: S Taylor and Dr F Saleh	Checked by: Nicki Lewis (Lead antimicrobial pharmacist, RSCH)