

Vaccinaties bij HIV en immuundeficiëntie

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PUBLICATION OF THE SUPERIOR HEALTH COUNCIL No. 9158

Vaccination of immunocompromised or chronically ill children and/or adults

In this scientific advisory report, which offers guidance to public health policy-makers, the Superior Health Council of Belgium provides recommendations on vaccination of immunocompromised individuals.

This report aims at providing clinicians of all specialities as well as the general practitioner with specific recommendations on vaccination of immunocompromised individuals.

This version was validated by the Board on September 2019[1]

https://www.health.belgium.be/nl/vaccinatie

2.3. Adults and teenagers ≥ 16 years

VACCINES	DISORDERS								
	IMID on ISD	PRIOR to SOT	AFTER SOT	Oncology	PRIOR to HSCT	AFTER HSCT	HIV CD4 < 200	HIV CD4 > 200	PID
INACTIVATED VACCINES									
dTpa (or DTPa)	S	S	S	S	S	A (DTPa only)	S	S	S
IPV	R	R	R	R	R	A	R	R	S
Haemophilus influenzae b	NA	R	R	NA	S	A	NA	NA	S
Hepatitis A	R	R	R	R	R	R	R	R	R
Hepatitis B	R	A	A	R	A	A	A	A	S
Influenza	A	A	A	A	A	A	A	A	A
Pneumococcal PPV23	A	A	A	A	A	A	A	A	A
Pneumococcal PCV13	A	A	A	A	A	A	A	A	A
Men ACWY (conjugated)	R	R	R	R	R	A	R	R	A
Men B	R	R	R	R	R	A	R	R	A
HPV	R	R	R	R	R	A	A	A	A
Zoster (inactivated)***	NA	NA	NA	NA	NA	NA	NA	NA	NA
LIVE VACCINES									
MMR	CI#	A**	CI#	CI#	CI#	A*	CI#	A	CI
Varicella	CI	A**	CI#	CI	CI#	A*	CI#	A	CI

2.3. Adults and teenagers ≥ 16 years

VACCINES	DISORDERS								
	IMID on ISD	PRIOR to SOT	AFTER SOT	Oncology	PRIOR to HSCT	AFTER HSCT	HIV CD4 < 200	HIV CD4 > 200	PID
Zoster (live)	CI	R**	CI	CI	CI	A*	CI	A	CI
INACTIVATED VACCINES FOR TRAVEL-RELATED EXPOSURES									
Rabies	R	R	R	R	R	R	R	R	R
Japanese encephalitis	R	R	R	R	R	R	R	R	R
Typhoid fever - inactivated	R	R	R	R	R	R	R	R	R
TBE	R	R	R	R	R	R	R	R	R
Cholera	NA	NA	NA	NA	NA	NA	NA	NA	NA
LIVE VACCINES FOR TRAVEL-RELATED EXPOSURES									
Yellow fever	CI#	R**	CI	CI	CI	R*#	CI	R	CI
Typhoid fever - oral	CI	R**	CI	CI	CI	R*	CI	R	CI

LEGEND

S	**Standard indication for vaccination because this concerns routine vaccinations that are part of the basic vaccination schedule that holds for the general population.**
A	**Strongly advised, given the additional risk posed by increased susceptibility and/or increased severity, and/or increased risk from complications**
R	**To consider in case of epidemiological or personal Risk**
CI	**Contra-Indicated**
NA	**Not Applicable**
*	> 24 months post HSCT in absence of immunosuppressive therapy and/or GVHD
**	> 4 weeks prior to activation transplant list
***	not available yet
#	after consultation with a specialist (in case of epidemiological or personal risk)

Vaccinatie bij HIV patiënten

- Basisvaccinatieschema voor volwassenen:
  - Check voor TdPa (10 jaar) en MBR (CD_4>200)
- Specifieke aandacht voor:
  - Hepatitis A en hepatitis B vaccinatie (serologie)
  - Griepvaccinatie (geïnactiveerd 4-ledig vaccin; jaarlijks)
  - Pneumokokkenvaccinatie (PCV_{13} – PPS_{23})
- Te overwegen
  - HPV vaccin (criteria)

Vaccinatie bij Immuundeficiëntie: Agenda

- Algemene principes

- Orgaantransplantatie (pre- en postTx)
- Hematologische maligniteiten en Stamceltransplantatie
- Oncologie / Chemotherapie
- Immuungemediëerde inflammatoire aandoeningen (IMID) en immuunsuppressieve geneesmiddelen (ISD)

- HD influenzavaccin en recombinant zostervaccin

Algemene principes

- Hogere vatbaarheid voor infecties
- Hoger risico voor ernstig/verwikkeld verloop van infecties
- Verminderde immunogeniciteit / effectiviteit door ziekte en/of therapie

  → Veel studies over immunogeniciteit en veiligheid – weinig studies over effectiviteit van vaccinatie

- Bespreek nut en veiligheid van vaccinatie met patiënt
  - Contraindicatie voor levend-afgezwakte vaccins (reisbestemming!)
  - Vaccinatie is geen oorzaak van opflakkering van IMID
  - Vaccinatie is geen oorzaak van rejectie na orgaanTx

Algemene principes

- Check basisvaccinatieschema en geef herhalingsinentingen
- Griepvaccinatie en pneumokokkenvaccinatie aanbevolen
- Overige vaccins ifv. epidemiologisch of persoonlijk risico

- Geef vaccinatie asap na diagnose en vóór start immunosuppressieve therapie (indien mogelijk)
- Overweeg therapie-interval (indien mogelijk) in overleg met patiënt en specialist of overweeg uitstel van vaccinatie tot na therapie (bv. reis)
- Bepaal antistoftiters indien gekende correlatie met klinische protectie
- Overweeg andere preventiemaatregelen (passieve immunisatie; vermijden expositie; …)

Orgaantransplantatie: PreTx

- Actualiseer vaccinatiestatus volgens basisschema / indicaties (reis)
- Check serologie voor Hep A – Hep B – MBR – VZV
- Hep B geindiceerd voor alle SOT – Hep A voor leverTx

- Timing: geïnactiveerde vaccins minstens 14 dagen preTx
  levend-afgezwakte vaccins minstens 1 maand preTx
- Stop vaccinaties indien dringende transplantatie en vervolledig vaccinatie na transplantatie

Orgaantransplantatie: PostTx

- Levend-afgezwakte vaccins tegenaangewezen (blijvende immuunsuppressie)
- Timing van vaccinatie ifv. niveau immuunsuppressie
  - Geïnactiveerde vaccins vanaf 3 tot 6 maanden postTx
  - Influenzavaccinatie vanaf 1 maand postTx
- Antistoftiters dalen sneller postTx (→ check serologie) en geef boosterdosis indien geïndiceerd

Belgian Guidelines 2019: PreTx

- Hepatitis A:
  - If non-immune (serology) and travel plans / in patients for liverTx
- Hepatitis B:
  - Check serology and give booster dose if anti-HBs Ab < 10 -100 IU/L
- Influenza:
  - Annual vaccination according to age / underlying disorders (SHC)
- Pneumococcal vaccine:
  - PCV_{13} followed by PPS_{23} according to age / underlying disorders (SHC)
- Meningococcal vaccine (quadrivalent ACWY – Men B):
  - According to age / underlying disorders / travel plans (SHC)
- Zoster:
  - Recombinant vaccine TBD (SHC)

Belgian Guidelines 2019: PostTx

- Hepatitis A:
  - Two doses prior to departure (at D0-M6 / D0-D28 / double dose D0) and check serology – booster dose at standard interval
  - Additional booster if negative serology
- Hepatitis B:
  - Check serology at 3 months postTx and annually thereafter
  - Give booster dose if anti-HBs Ab < 10 - 100 IU/L and check serology after one month
- Influenza and Pneumococcal vaccine:
  - Strongly recommended in SOT patients

Influenza Vaccination PostTx

- Can be given as early as one month post-TX
- Single dose of standard quadrivalent vaccine ; yearly

- Vaccination is effective in reducing complications and ICU admission
  (large cohort study; no RCT)
- Vaccination is safe
  - Similar rates of allograft rejection
  - Similar rates of local and systemic adverse effects

- No indication (yet) for double dose or high dose or adjuvanted vaccine
  - Higher seroconversion and seroprotection rates for HD and DD vaccine
  - Higher GMT levels for HD and DD, but not for all strains and at one year
  - No serological advantage of adjuvanted vaccine

Pneumococcal Vaccination PostTx

- IPD is more frequent and more severe in SOT patients
- Pneumococcal vaccination is recommended in SOT patients
- Pneumococcal vaccination is safe (similar rejection rates and adverse alloresponses)
- SOT patients mount a (weaker peak but comparable long-term) serological response to PCV as well as to PPS; no documented benefit of prime/boost strategy
- Repeat vaccination with PPS23 after 5 years
- Limited data on clinical protection against IPD in SOT patients



Vaccination of solid organ transplant candidates and recipients: Guidelines from the American society of transplantation infectious diseases community of practice

Lara Danziger-Isakov[1] | Deepali Kumar[2] | On Behalf of The AST ID Community of Practice

Clinical Transplantation. 2019;33:e13563.
https://doi.org/10.1111/ctr.13563

Hematologische maligniteiten

Vaccination policy in adult patients with hematological malignancies or asplenia without stem cell transplantation: Recommendations from the advisory board on vaccination of the Belgian Hematological Society

J. Loos, MD[1], M. Beckers, MD, PhD[1], V. Beckers, MD[2], M. Hoyoux, MD[3], W. Peetermans MD, PhD[4], A. Van De Velde, MD, PhD[5], V. Van Hende, MD[6], A. Vanderfaeillie, MD[7], Y. Van Laethem, MD, PhD[8], A. Janssens, MD, PhD[1,9]

(BELG J HEMATOL 2020;11(7):305-316)

Stamceltransplantatie

Vaccination guidelines in haematopoietic transplant patients: recommendations from the BHS Transplant Committee

I. Moors, MD[1], H. Schoemans, MD, PhD[2], S. Callens, MD, PhD[3], Y. Beguin, MD, PhD[4], T. Kerre, MD, PhD[1]

(Belg J Hematol 2014;5(2):44-54)

Vaccination of patients with haematological malignancies who did not have transplantations: guidelines from the 2017 European Conference on Infections in Leukaemia (ECIL 7)

Malgorzata Mikulska, Simone Cesaro, Hugues de Lavallade, Roberta Di Blasi, Sigrun Einarsdottir, Giuseppe Gallo, Christina Rieger, Dan Engelhard, Thomas Lehrnbecher, Per Ljungman, Catherine Cordonnier, on behalf of the European Conference on Infections in Leukaemia group

***Lancet Infect Dis* 2019; 19: e188–99**

Vaccination of haemopoietic stem cell transplant recipients: guidelines of the 2017 European Conference on Infections in Leukaemia (ECIL 7)

Catherine Cordonnier, Sigrun Einarsdottir, Simone Cesaro, Roberta Di Blasi, Malgorzata Mikulska, Christina Rieger, Hugues de Lavallade, Giuseppe Gallo, Thomas Lehrnbecher, Dan Engelhard, Per Ljungman, on behalf of the European Conference on Infections in Leukaemia group

***Lancet Infect Dis* 2019; 19: e200–12**



Stamceltransplantatie

- Geheugen T-cel functie is verloren na ScTx; antistoftiters persisteren gedurende weken tot maanden
- Hepatitis B vaccinatie geïndiceerd preTx (serologie)
- Influenzavaccinatie bij pt en contactpersonen; booster dosis vroegtijdig postTx (vanaf 3 maand)

- Hervaccineer met (kinder-)basisvaccinatieschema vanaf 6 tot 12 maanden postTx
- Levend-afgezwakte vaccins vanaf 24 maanden post TX indien geen GVHD en geen immuunsuppressie sinds 3 maanden en CD4 >200

Oncologie - Chemotherapie

- Influenza- en Pneumokokkenvaccinatie aanbevolen
- Timing ifv. seizoen (griep) en start/duur chemotherapie (pneumokok; reisvaccinaties)

- Geïnactiveerde vaccins vanaf 3 maand na beëindigen immuunsuppressieve chemotherapie
- Levend-afgezwakte vaccins vanaf 6 maanden na beëindigen immuunsuppressieve chemotherapie

- TBD: Influenza HD en recombinant zostervaccin

Vaccinatie bij IMID en ISD

- Heterogene groep van patiënten en geneesmiddelen
- Check vaccinatiestatus en antistoftiters voor start therapie – geef booster dosis indien geïndiceerd
- Influenza- en pneumokokkenvaccinatie aanbevolen

- Geef levend-afgezwakte vaccins (Gele koorts) 1 maand voor start therapie
- Overweeg therapie-interval in overleg met patiënt en specialist – timing levend-afgezwakte vaccin ifv. verwachte duur van immuunsuppressie (zie lijst HGR en RIVM) – herstart immuunsuppressie 1 maand na toediening

5. LIST OF (POTENTIALLY) IMMUNOSUPPRESSIVE MEDICATIONS

Pharmacokinetics: As a rule of thumb there are no significant concentrations of a medication present after five times the elimination half-life.
Pharmacodynamics: The suppressive effect on the immune system can last longer than the presence of detectable concentrations in the blood. In anti-cytokine drugs the immunosuppressive effects after clearance in the serum will be of shorter duration than in drugs that inhibit cell division and cell function. As a rule of thumb the immunosuppressive effect after stopping a drug will be waned 2 weeks after elimination of anti-cytokine drugs and 4 week after elimination of other drugs, unless there are other data found in the literature.

There are several drugs known that can lead to prolonged suppression of T and B lymphocytes: Obinutuzumab, Rituximab, Alemtuzumab. In the table there is a minimum duration indicated before a live-attenuated vaccine can be given, provided that the absolute CD4+ T-lymphocytes, CD8+ T-lymphocytes and B-lymphocytes are within the normal range.

Table: Safe interval of live-attenuated vaccines

Medication	Elimination half-life	Safety margin (in weeks)	**Recommended interval: 5 xt 1/2 + safety margin before vaccination**
high dose prednisone > 1mg/kg/d, > 14 days (children) > 20 mg/d, > 14 days (adults)	6 hours	4	**1 month**
Methotrexate low dose: ≤0.4 mg/kg/week or ≤20 mg (adults)	3-17 hours		**Individual assessment***
Methotrexate high dose >0.4 mg/kg/week or >20 mg (adults)	3-17 hours	4 4	**1 month** **1 month**
6-mercaptopurine	5 hours	4	**1 month**

Medication	Elimination half-life	Safety margin (in weeks)	**Recommended interval: 5 xt 1/2 + safety margin before vaccination**
Azathioprine	5 days	4	**2 month¶**
Basiliximab	4-10 days	4	**3 month**
Belatacept	8-10 days	4	**3 month**
Cyclosporine	6 hours	4	**1 month**
Everomilus	30 hours	4	**6 weeks**
Fotemustine	83 hours	4	**6 weeks**
Leflunomide			**2 years****
Mitotranxone	12 days	4	**3 month**
Mycophenolate mofenil	12-18 hours	4	**1 month**
Sirolimus	50-70 hours	4	**6 weeks**
Tacrolimus	12-15 hours	4	**1 month**

Medications for IMID			
Abatacept	13 (8-25) days	2	**3-4 months**
Alemtuzumab			**6 months‡**
Anakinra	6 hours	2	**2 weeks**
Apremilast	9 hours	2	**2 weeks**
Baricitinib	12,5 hours	2	**2 weeks**
Belimumab	19 days	4	**4 months**
Canakinumab	26 days	2	**5 months**
Daclizumab	21 days	4	**6 months**
Eculizumab	8-20 days	4	**6 months°**
Fingolimod	6-9 days	4	**3 months**
Ixekizumab	13 days	4	**3 months**
Natalizumab	16 days	4	**3 months**
Secukinumab	27 (18-46) days	4	**9 months**
Siltuximab	16 days	2	**4 months**
Teriflunomide	19 days	4	**6 months**
Tocilizumab	6-23 days	4	**3 months**
Tofacitinib	3 hours	4	**1 month**
Ustekinumab	15-32 days	4	**4 months**
Vedolizumab	25 days	4	**5 months**

TNF inhibitors			
Adalimumab	2 weeks	2	**3 months**
Certolizumab	14 days	2	**3 months**
Golimumab	12 days	2	**3 months**
Etanercept	70 hours	2	**1 month**
Infliximab	12 weeks	2	**4 months**

Monoclonal antibodies / cytokines			
Brentuximab	5d		**3 months**
Elotuzumab	8d	4	**3 months**
Ipilimumab	15d	4	**4 months**
Obinutuzumab	37 d	4	**6 months****
Rituximab			**1 year****



Treatment for MS			
Alemtuzumab			**6 month‡**
Daclizumab	21d	4	**6 month**
Dimethyl fumaraat	1 h	2	**2 weeks‡**
Fingolimod	6-9d	4	**3 month**
Glatiramer acetate	21d	4	**6 month**
Natalizumab	16d	4	**3 month**
Teriflunomide	19d	4	**4 month**



Alkylating medication			
Melfalan	1 hours	4	**1 month**
Busulfan	3 hours	4	**1 month**
Cyclophosphamide	9 hours	4	**1 month**
Ifosfamide	22 hours	4	**6 weeks**
Chloorambucil	2 hours	4	**1 month**
Other alkylating medication			
Bendamustine	0,5 h	4	**1 month**
Dacarbazine	5 h	4	**1 month**
Estramustine	110 h#	4	**2 months**
Temozolomide	1,8 h	4	**1 month**
Thiotepa	4 h	4	**1 month**

5.2. List of medication not considered immunosuppressive

- **Paracetamol, NSAID, Sulphasalazine, (hydroxy) chloroquine**
- **Corticosteroids**
  - Short treatment with corticosteroids (< 14 days) or long-term treatment with a daily dose
    - of < 10 mg prednisone (8 mg methyprednisolone) or equivalent in adults
    - < 0.3 mg/kg/d prednisone or equivalent in children
  - Physiological doses (substitution treatment)
  - Inhalation steroids
    Topical steroids (skin, ears, eyes)
  - Intra-articular, bursal, or intra-tendon injection of steroids
  - Budesonide enteric coating (Entocort®, etc.)

- **Glatiramer acetate Copaxone®** (Sanofi-Aventis) (MS) (www.bcfi.be/www.cbip.be)
- **Selective Estrogen-receptor modulators** (treatment of hormone responsive breast cancer) Clomifen, tamoxifen, toremifen, raloxifen, fulvestrant (www.bcfi.be/http://www.cbip.be)
- **Aromatase-Inhibitors** (estrogen synthesis inhibitors; treatment of hormone responsive breast cancer) Anastrozol, exemestan, letrozol (www.bcfi.be/www.cbip.be)
- **Growth factors** Hematopoietic growth factors (Granulocyte colony- stimulating factors,G-CSF)
- **Antiviral therapy: HIV-drugs, ribavirin, interferon, inosine pranobex**.

Treatment with interferons can weaken the efficacy of some live-attenuated vaccines (because of the mode of action), but there is no increase in side effects.



https://www.health.belgium.be/nl/vaccinatie

5.3 List of medication probably not immunosuppressive

- Hydroxycarbamide (Hydrea®)*
- Monoclonal antibodies against:
  - VEGF (vascular endothelial growth factor)
  - EGFR (epidermal growth factor)
  - Growth factor HER-2

Anti GD2, AntiPD1, IL2 analogon

- Aflibercep (Eylea®, Zaltrap®)
- Aldesleukine (Proleukin®)
- Bevacizumab (Avastin®)
  Cetuximab (Erbitux®)
  Dinutuximab
- Nivolumab (Opdivo®)
- Panitumumab (Vectibix®)
- Pembrolizumab (Keytruda®)
- Ramucirumab (Cyramza®)
  Trastuzumab (Herceptin®)

https://www.health.belgium.be/nl/vaccinatie

Influenza HD vaccin bij ICpatiënten

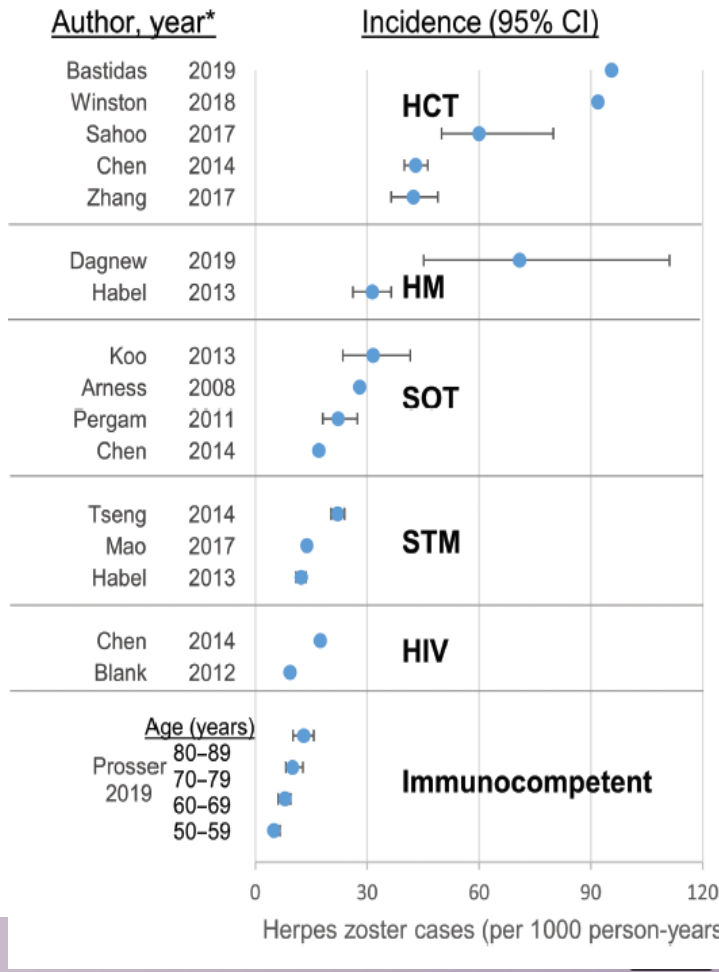
Group	Reference	Population	N		Post-vaccination HAI GMT ratio (GMT IIV3-HD/GMT IIV3-SD)		
			IIV3-HD	IIV3-SD	A/H1N1	A (H3N2)	B
Transplant recipients	Natori 2017	Adult (≥ 18 y) solid organ transplant recipients	87	77	1.64 (373.4/227.3)	1.52 (688.6/453.1)	1.87 (834.3/446.4)
	GiaQuinta 2015	Pediatric (3–17 y) solid organ transplant patients	22	15	2.49 (773.2/310.3)	0.97 (131.7/136.1)	1.02 (36.8/36.2)
	Halasa 2015	Adult (≥ 18 y) hematopoietic stem cell transplant patients	29	15	1.48 (99.3/67.3)	6.86 (207.9/30.3)	1.14 (37.3/32.8)
Cancer patients	Hakim 2016	Children and young adults (3–21 y)[a]	21	22	1.41 (218/155) 0.96 (80/83)	2.09 (167/80) 1.02 (64/63)	1.29 (187/145) 0.92 (11/12)
	McManus 2014	Pediatric patients (3–17 y) with acute lymphoblastic leukemia	24	13	0.30 (97.9/322.9)	0.82 (62.9/76.5)	1.47 (74.4/50.6)
	Jamshed 2016	Adults < 65 y receiving chemotherapy for cancer	50	50	1.38 (1350.1/979.1)	1.41 (1143.4/811.2)	1.54 (351.6/228.0)
HIV-infected individuals	Hakim 2016	HIV-infected children and young adults (3–21 y)	20	20	1.40 (373/267) 1.60 (279/174)	1.08 (154/143) 0.69 (70/102)	0.93 (160/172) 1.00 (13/13)
	McKittrick 2013	HIV-infected adults (≥ 18 y)	97	93	2.3 (1.4-3.7)	2.0 (1.2-3.3)	2.2 (1.4-3.3)
Individuals with autoimmune diseases	ClinicalTrials.gov	Adults 18–64 y with stable rheumatoid arthritis	16	19	2.28 (207.5/90.9)	1.53 (167.1/109.1)	1.65 (36.1/21.9)
			16	19	3.67 (442.9/120.6)	1.80 (257.7/143.4)	1.94 (51.9/26.8)
			16	19	2.50 (123.4/49.4)	1.47 (115.6/78.5)	1.05 (16.1/15.3)

Samson SI, et al. Expert Rev Vaccines 2019;18:295-308.

Herpes Zoster Risk in Immunocompromised Adults in the United States: A Systematic Review

Susannah L. McKay,[1,2] Angela Guo,[2] Steven A. Pergam,[3,4,5,6] and Kathleen Dooling[2]

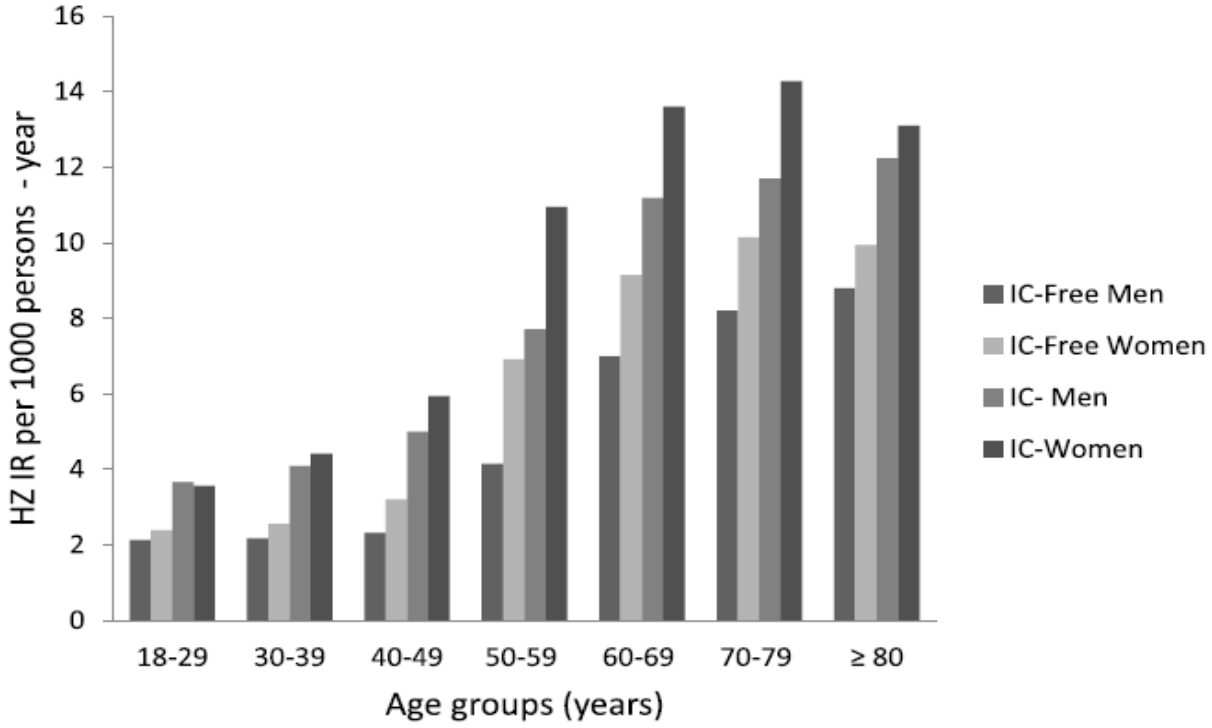
Clinical Infectious Diseases® **2020;71(7):e125–34**



Herpes zoster risk and burden of disease in immunocompromised populations: a population-based study using health system integrated databases, 2009–2014

Cintia Muñoz-Quiles[1*†], Mónica López-Lacort[1†], Javier Díez-Domingo[1,2] and Alejandro Orrico-Sánchez[1]

BMC Infectious Diseases (2020) 20:905



Adjuvanted Recombinant Zoster Vaccin

Immunogenicity and Safety of the Adjuvanted Recombinant Zoster Vaccine in Chronically Immunosuppressed Adults Following Renal Transplant: A Phase 3, Randomized Clinical Trial

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Clinical Infectious Diseases® 2020;70(2):181–90

Immunogenicity and Safety of the Adjuvanted Recombinant Zoster Vaccine in Patients With Solid Tumors, Vaccinated Before or During Chemotherapy: A Randomized Trial

Peter Vink, MD[1]; Ignacio Delgado Mingorance, MD[2]; Constanza Maximiano Alonso, MD[3]; Belen Rubio-Viqueira, MD[4]; Kyung Hae Jung, MD, PhD[5]; Juan Francisco Rodriguez Moreno, MD, PhD[6]; Enrique Grande, MD[7]; David Marrupe Gonzalez, MD[8]; Sarah Lowndes, MD, PhD[9]; Javier Puente, MD, PhD[10]; Hartmut Kristeleit, MD[11]; David Farrugia, MD, PhD[12]; Shelly A. McNeil, MD[13]; Laura Campora, MD[14]; Emmanuel Di Paolo, MSc[15]; Mohamed El Idrissi, MSc[15]; Olivier Godeaux, MD[16]; Marta López-Fauqued, PhD[14]; Bruno Salaun, PhD[15]; Thomas C. Heineman, MD, PhD[17]; and Lidia Oostvogels, MD[14]; on behalf of the Zoster-028 Study Group

Cancer 2019;125:1301-1312.

Adjuvanted Recombinant Zoster Vaccin

Effect of Recombinant Zoster Vaccine on Incidence of Herpes Zoster After Autologous Stem Cell Transplantation
A Randomized Clinical Trial

Adriana Bastidas, MD; Javier de la Serna, MD; Mohamed El Idrissi, MSc; Lidia Oostvogels, MD; Philippe Quittet, MD; Javier López-Jiménez, MD, PhD; Filiz Vural, MD; David Pohlreich, MD; Tsila Zuckerman, MD; Nicolas C. Issa, MD; Gianluca Gaidano, MD, PhD; Je-Jung Lee, MD; Sunil Abhyankar, MD; Carlos Solano, MD, PhD; Jaime Perez de Oteyza, MD, PhD; Michael J. Satlin, MD; Stefan Schwartz, MD; Magda Campins, MD, PhD; Alberto Rocci, MD, PhD; Carlos Vallejo Llamas, MD, PhD; Dong-Gun Lee, MD, PhD; Sen Mui Tan, MD; Anna M. Johnston, MBBS; Andrew Grigg, MBBS, FRACP, MD; Michael J. Boeckh, MD, PhD; Laura Campora, MD; Marta Lopez-Fauqued, PhD; Thomas C. Heineman, MD, PhD; Edward A. Stadtmauer, MD; Keith M. Sullivan, MD; for the ZOE-HSCT Study Group Collaborators

JAMA. 2019;322(2):123-133.

Immunogenicity and safety of the adjuvanted recombinant zoster vaccine in adults with haematological malignancies: a phase 3, randomised, clinical trial and post-hoc efficacy analysis

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Lancet Infect Dis 2019; 19: 988–1000

Vaccinaties bij HIV en Immuundeficiëntie

- HIV is een chronische aandoening waarvoor standaardvaccinaties; hepatitis A en B, influenza en pneumokokkenvaccinatie

- Belgische (en internationale) praktijkrichtlijnen voor vaccinaties bij de verschillende populaties van immuundeficiënte patiënten

  https://www.health.belgium.be/nl/vaccinatie

- Denk tijdig aan vaccinatie bij diagnose en tijdens immuunsuppressieve therapie
- Bespreek indicaties/contraindicaties en effectiviteit/veiligheid met patiënt