Hodgkin lymfoom

Daan Dierickx
Dienst Hematologie, UZ Leuven
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Lymfkdierkanker Vereniging Vlaanderen vzw

UZ Leuven | Herestraat 49 B - 3000 Leuven | www.uzleuven.be tel. +32 16 33 22 11

UNIVERSITY HOSPITALS LEUVEN

Inleiding

Thomas Hodgkin (1798-1866)

1832: eerste beschrijving van “clinical entity of the absorbent gland and spleen in six patients“

ON SOME

MORBID APPEARANCES

OF

THE ABSORBENT GLANDS

AND

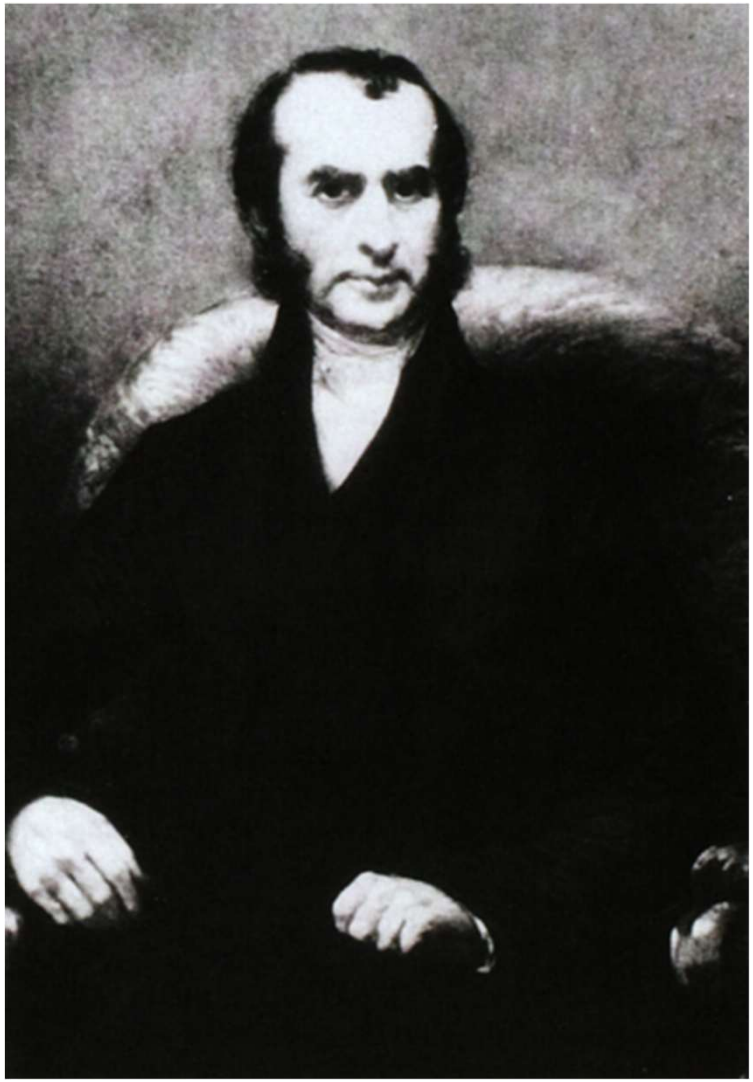
SPLEEN.

BY DR. HODGKIN.

PRESENTED

BY DR. R. LEE.

READ JANUARY 10TH AND 24TH, 1832.



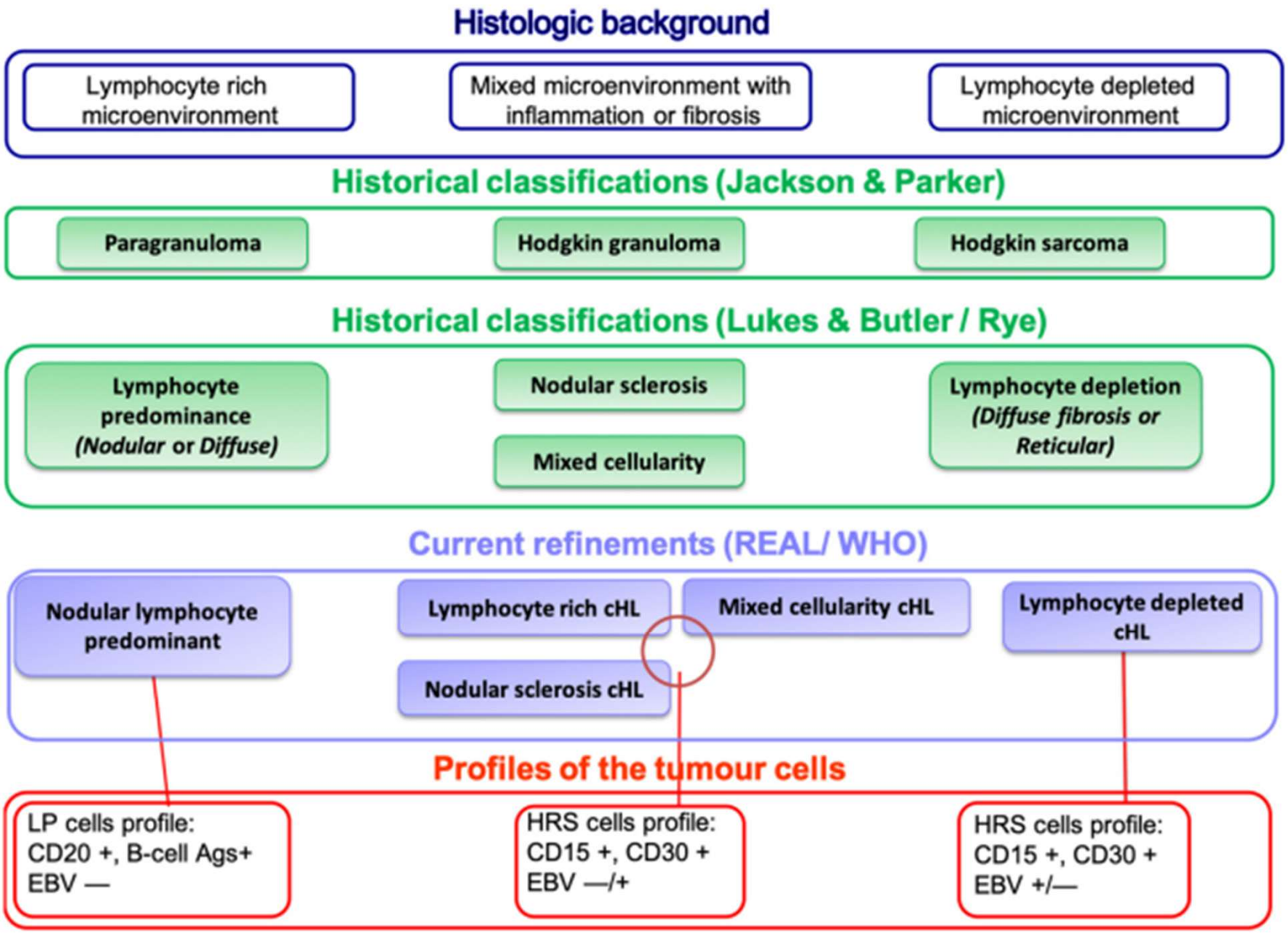
Hodgkin T. Medica-Chirurgical Transactions 1832;17:68-114
Dann EJ. Rambam Maimonides Med J 2017;8:e0009
Rosenfeld L. Ann Diagn Pathol 2000;4:124-33

Inleiding

Gordon Museum, King's College, London, Guy's Campus, Hodgkin House

Dann EJ. Rambam Maimonides Med J 2017;8:e0009
Rosenfeld L. Ann Diagn Pathol 2000;4:124-33

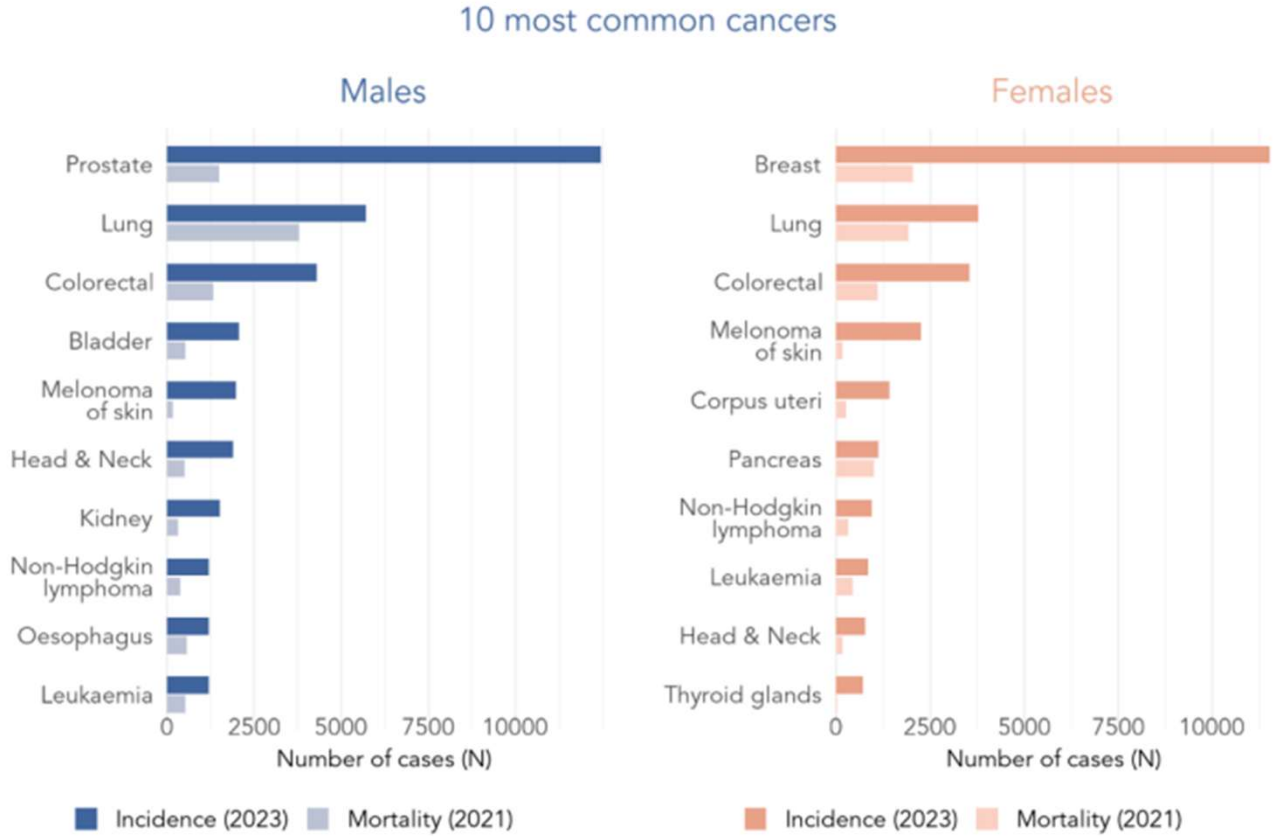
Inleiding



Carbone A, Alibrahim MN. Cancers (Basel) 2025;17:2929

Incidentie

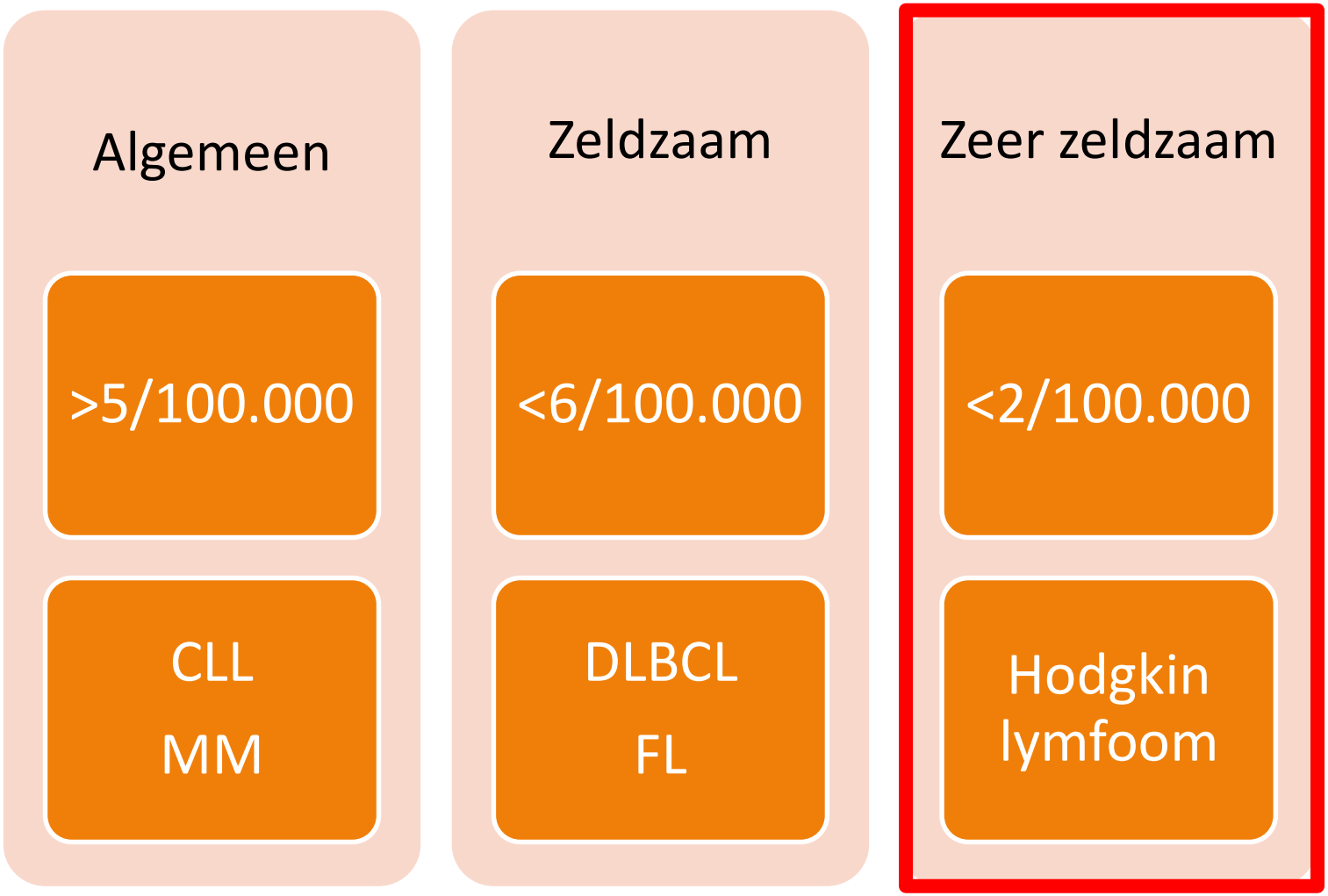
Incidentie: 2-3/100.000 per jaar*



*Borstkanker: 130/100.000/jaar

www,kankerregister.org

Incidentie



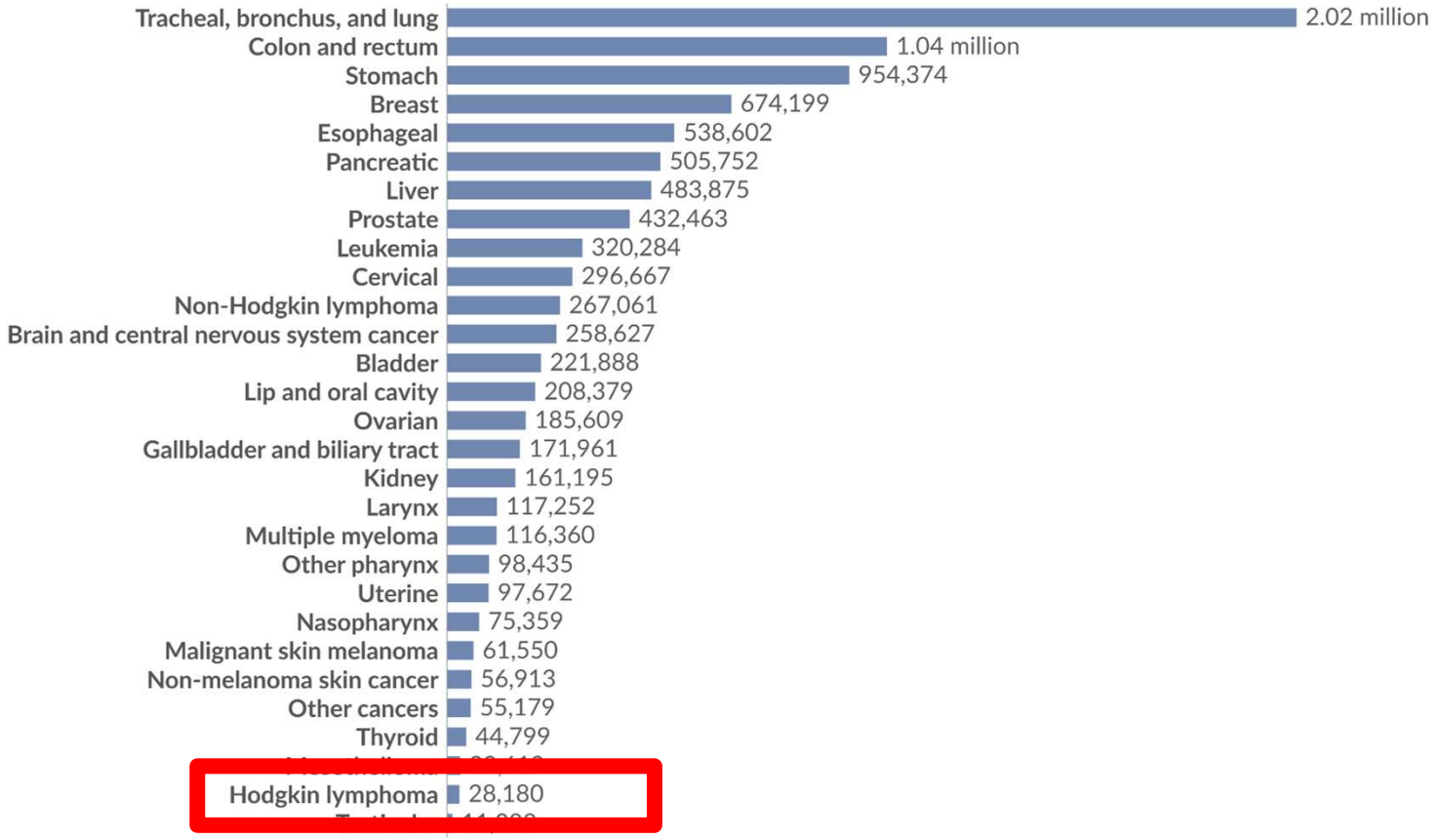
Gatta G, et al. Adv Exp Med Biol 2010;686:285-303 (RARECARE consortium)

Incidentie

Cancer deaths by type, World, 2021

Our World in Data

Total annual number of deaths from cancers[1] across all ages and both sexes, broken down by type.

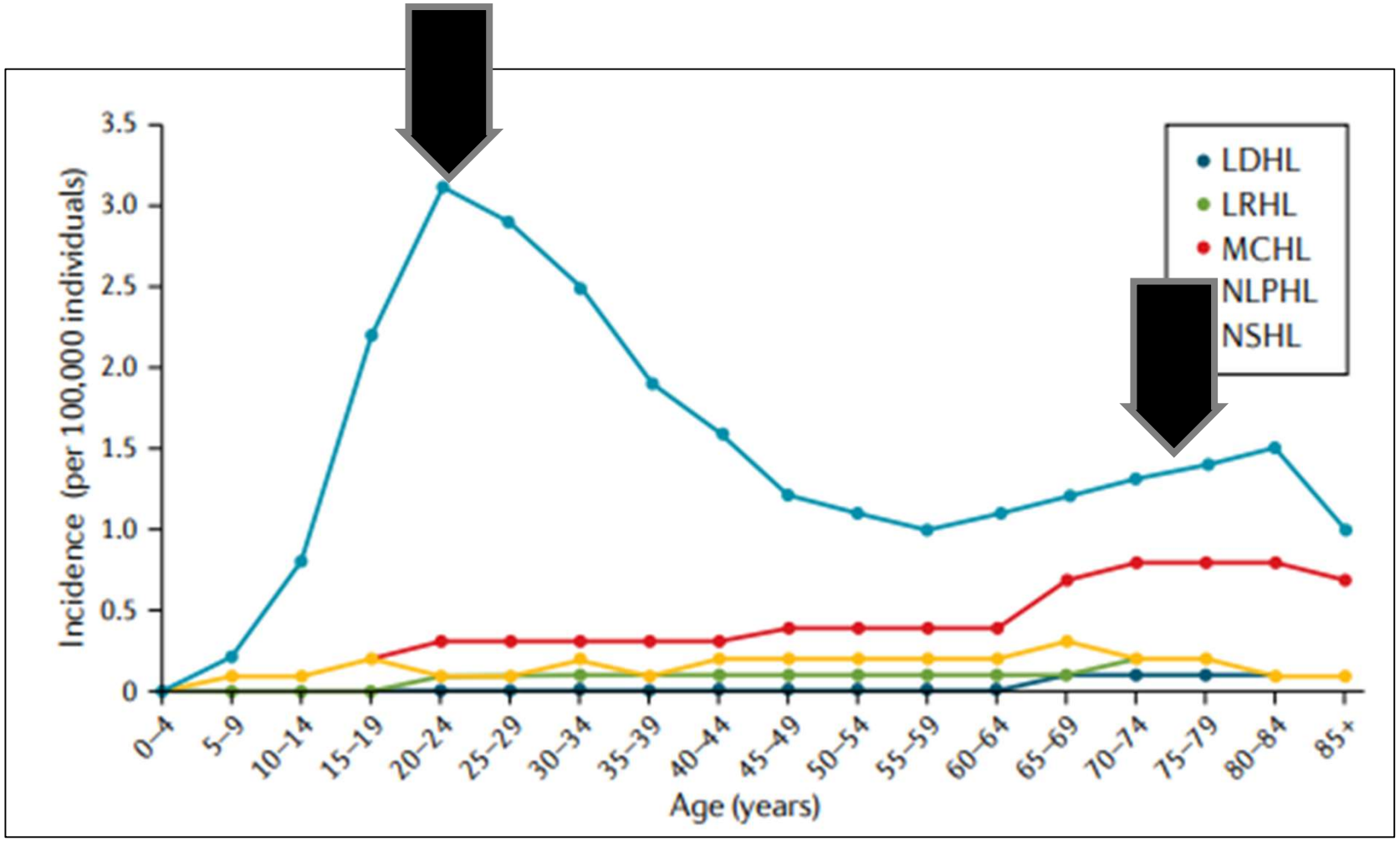


Data source: IHME, Global Burden of Disease (2024)

OurWorldinData.org/cancer | CC BY

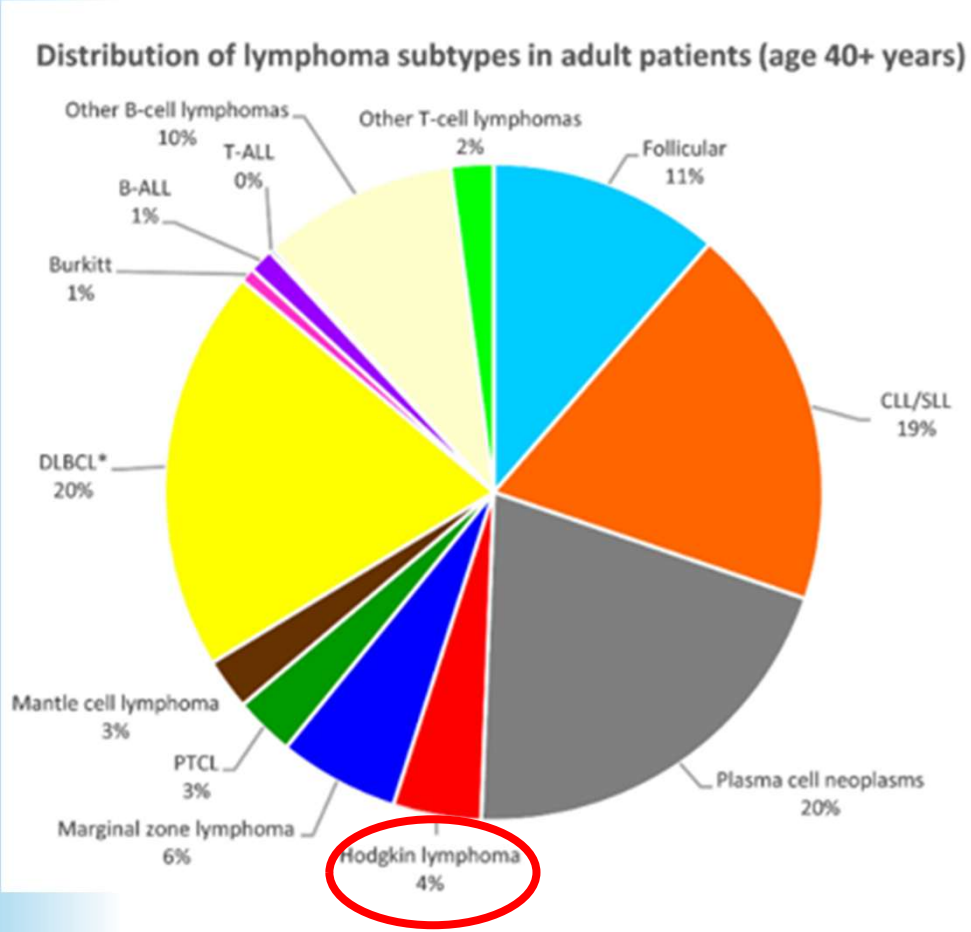
1. Cancer Cancer describes a group of diseases in which abnormal cells in the body begin to grow and multiply uncontrollably. These cells can form lumps of tissue called tumors, which can interfere with normal bodily functions.
Cancerous cells have the potential to spread to other parts of the body (this process is called "metastasis"), disrupting normal processes and causing serious health problems.

Incidentie

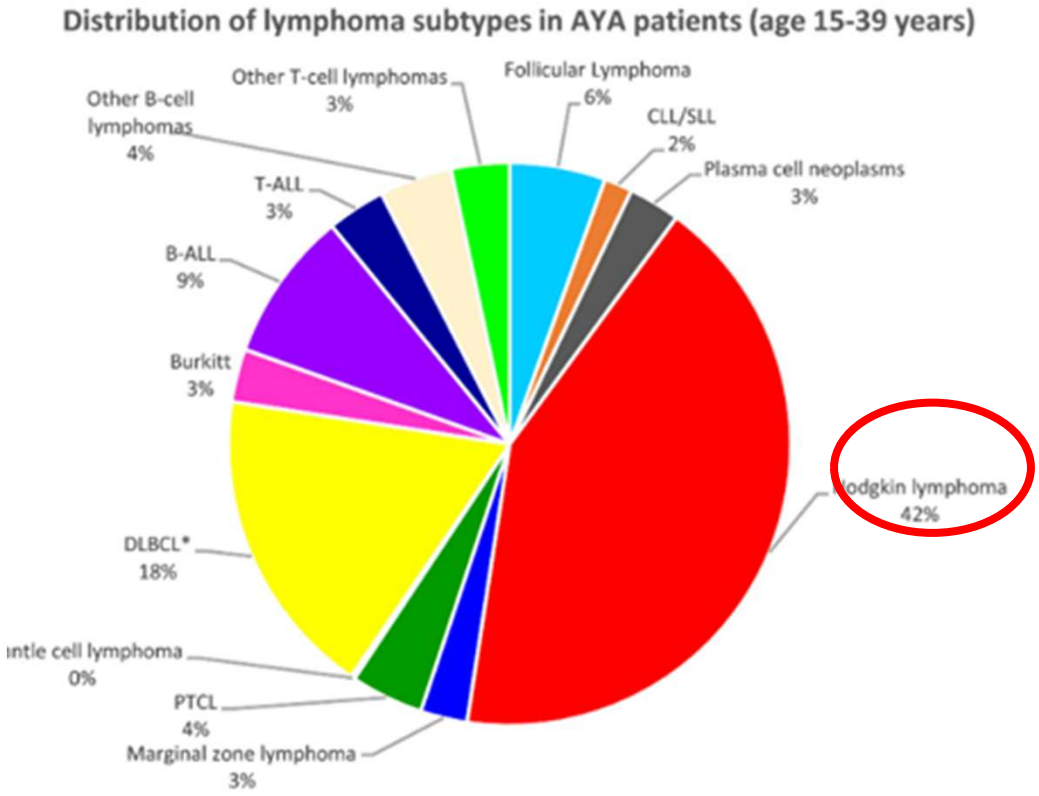


Connors JM, et al. Nat Rev Dis Primers 2020;6:61

Incidentie



AYA

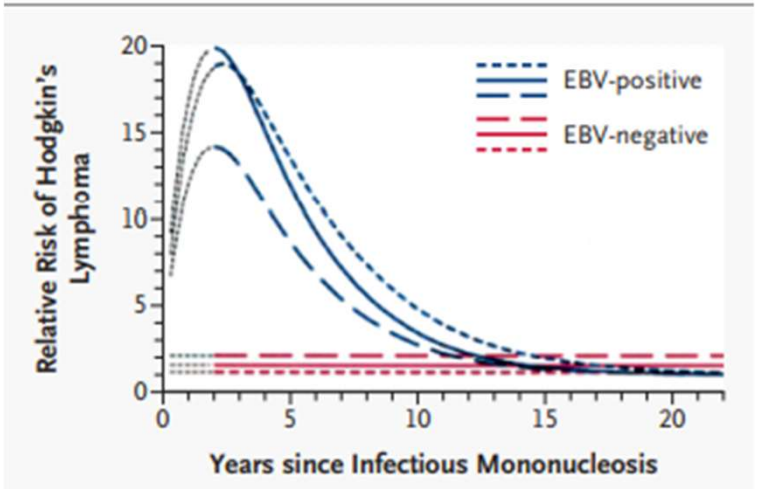


Blum KA, et al. Br J Haematol 2018;183:385-99

Risicofactoren

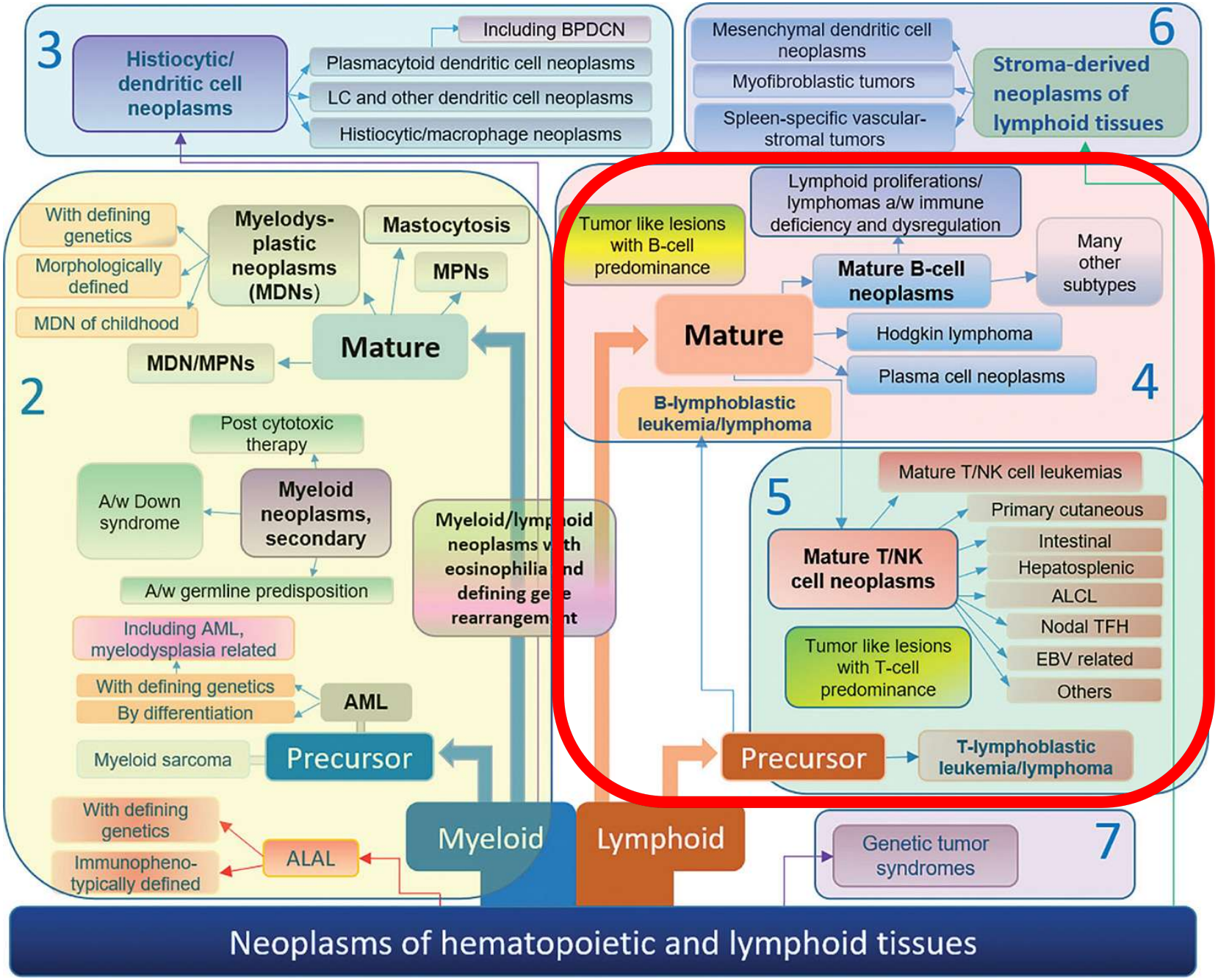
- In meeste gevallen: niet gekend
- Verminderde immuunweerstand:
  - HIV
  - Na orgaantransplantatie
- Mononucleosis infectiosis

  (AYAs: 10-20% EBV positief)?
- Genetische factoren



Hjalgrim H, et al. N Engl J Med 2003;349:1324-32

WHO classificatie



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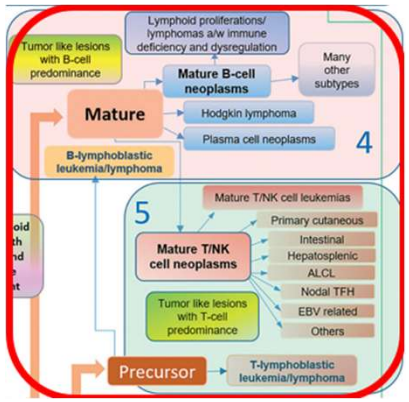


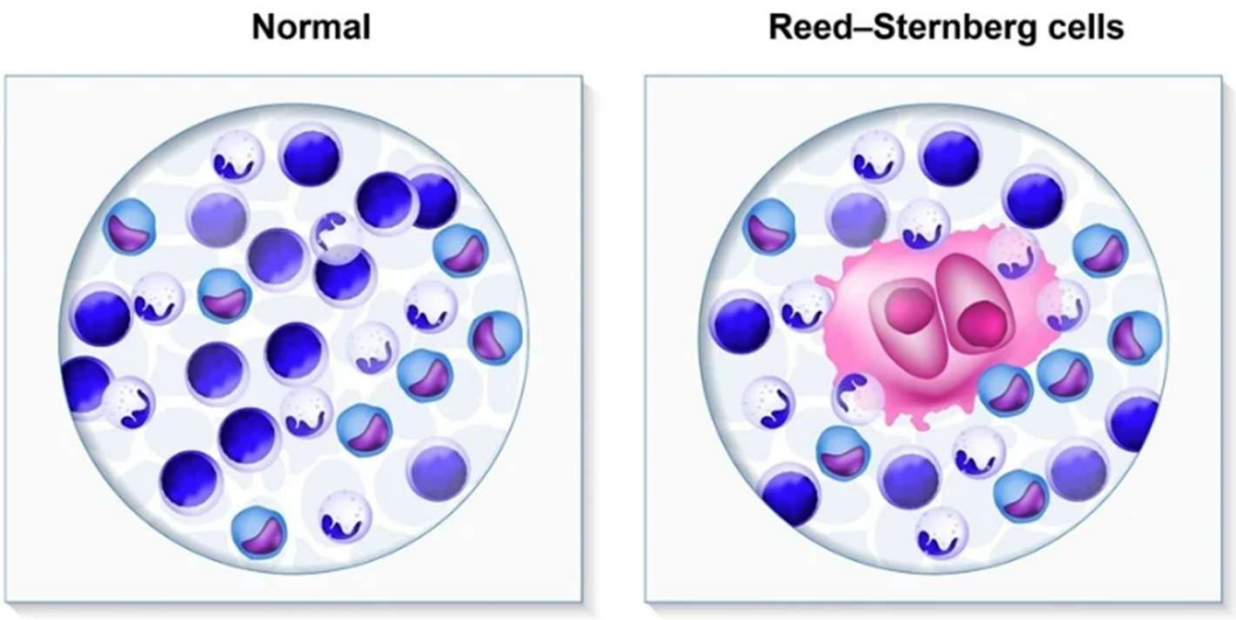
Hodgkin lymfoom (HL)	Non-Hodgkin lymfoom (NHL)
10-15% Klassiek HL	B-cel NHL 80%
Niet-klassiek HL	T/NK-cel NHL 5-10%

Classificatie

Uniek aan Hodgkin lymfoom:

weinig tumorale cellen

veel immuuncellen (tumor micro-omgeving)

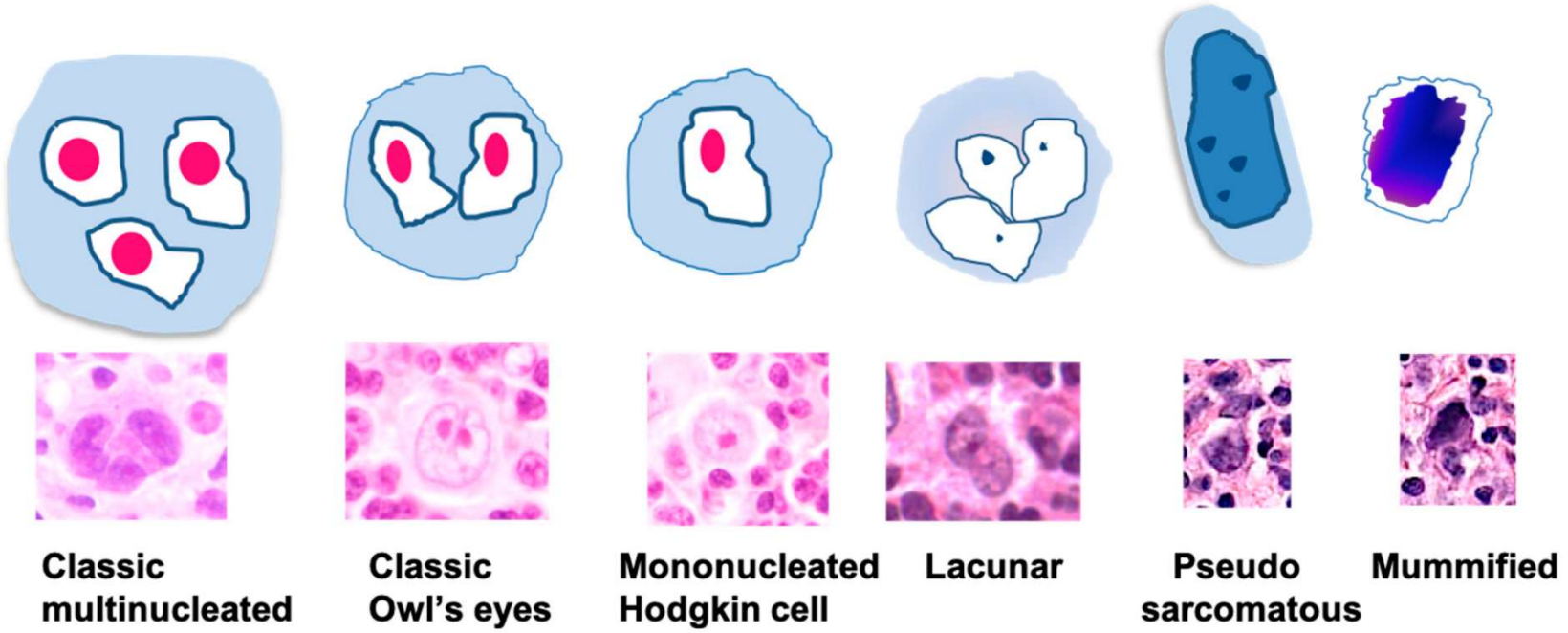


https://www.news-medical.net/health/Hodgkins-Lymphoma-Classification.aspx

Classificatie

Uniek aan Hodgkin lymfoom:
weinig tumorale cellen

Hodgkin Reed-Sternberg cells. *Classic and variants*



Carbone A, Alibrahim MN. Cancers (Basel) 2025;17:2929

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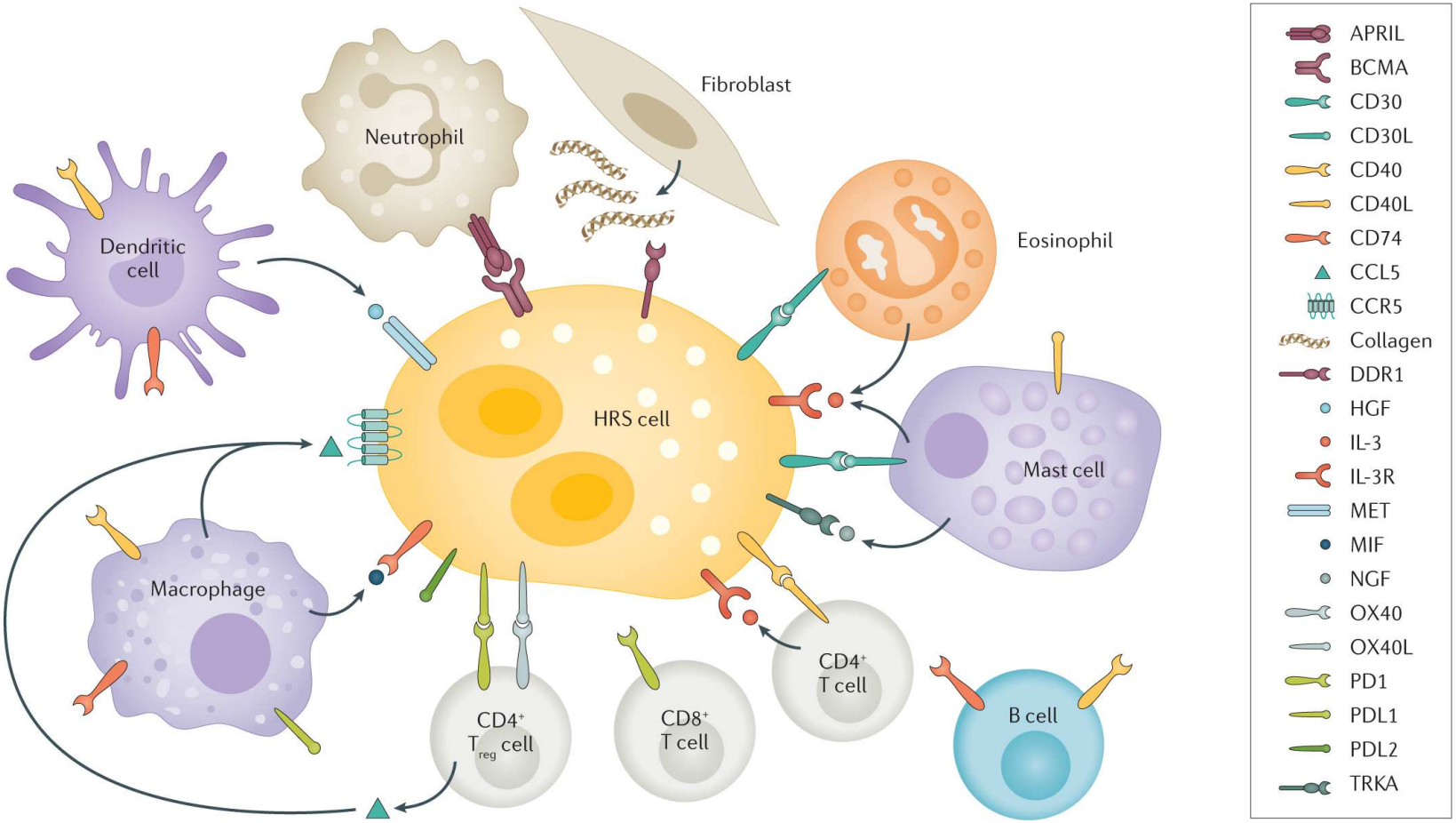


Connors JM, et al. Nat Rev Dis Primers 2020;6:61

Classificatie

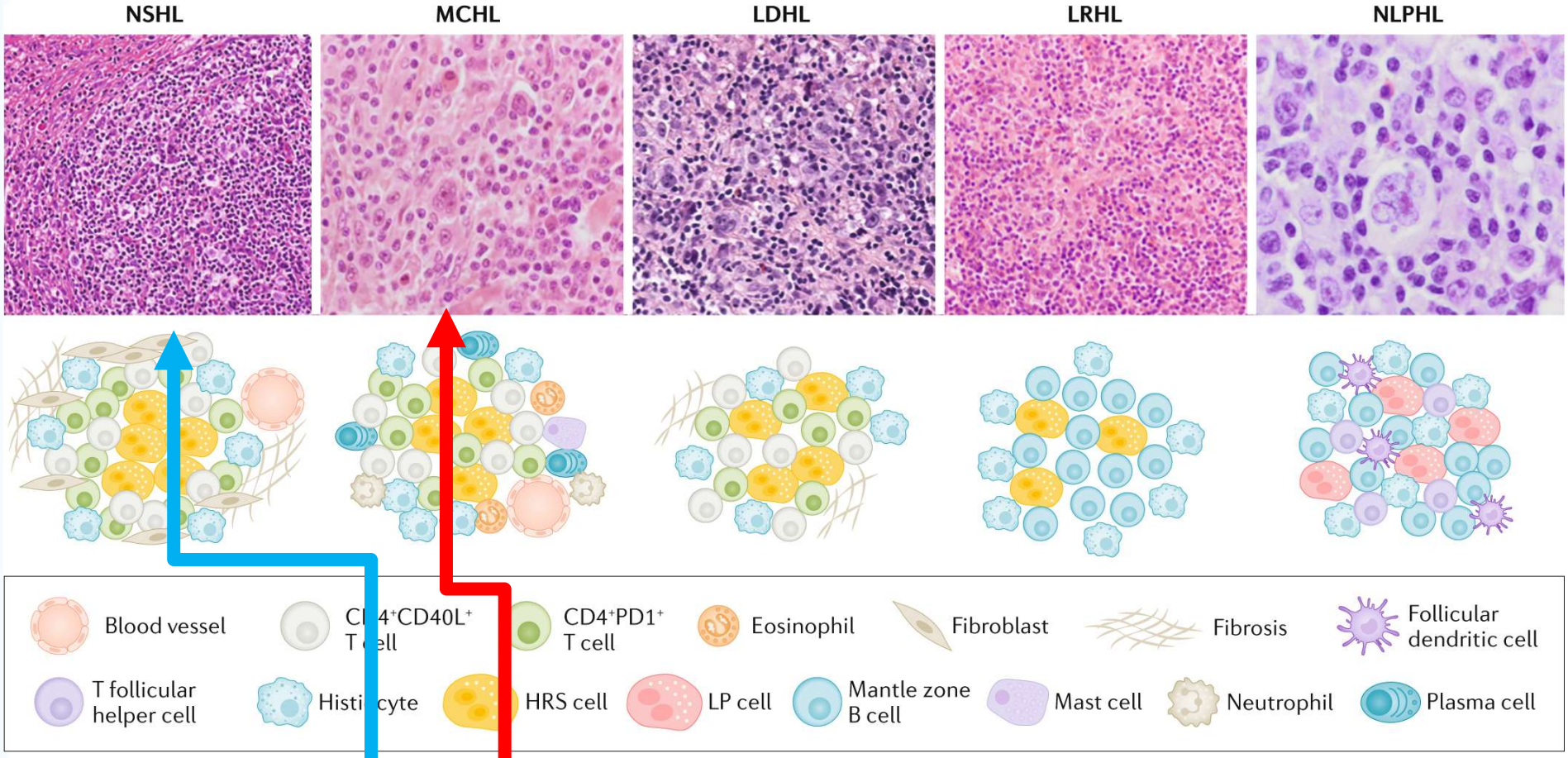
Uniek aan Hodgkin lymfoom:
veel immuuncellen (tumor micro-omgeving)

Klassiek Hodgkin lymfoom	**95%**
• Nodular Sclerosis Hodgkin lymphoma (NSHL)	**70%**
• Mixed Cellularity Hodgkin Lymphoma (MCHL)	**25%**
• Lymphocyte Depleted Hodgkin Lymphoma (LDHL)	**1%**
• Lymphocyte Rich Hodgkin Lymphoma (LRHL)	**5%**
Niet-klassiek Hodgkin lymfoom	**5%**
• Nodular Lymphocyte Predominant Hodgkin Lymphoma (NLPHL)	5%

Classificatie

Uniek aan Hodgkin lymfoom:

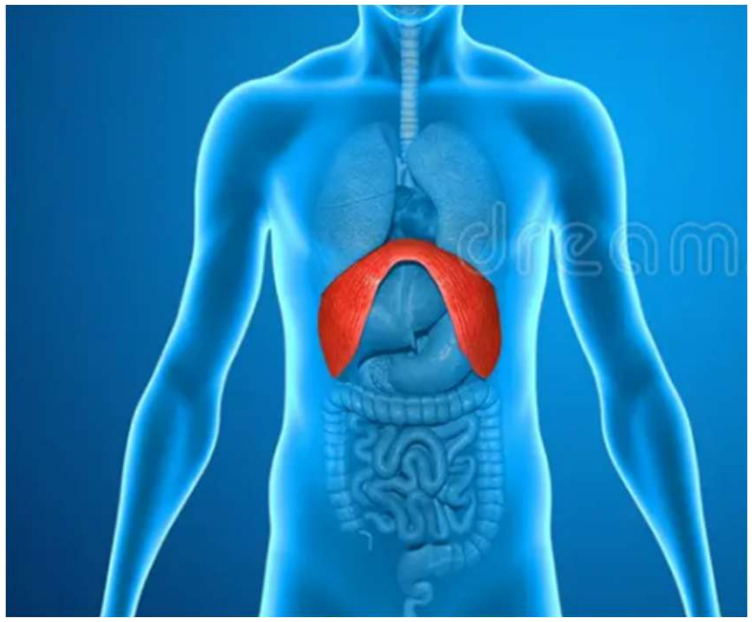
veel immuuncellen (tumor micro-omgeving)



Connors JM, et al. Nat Rev Dis Primers 2020;6:61

Symptomen

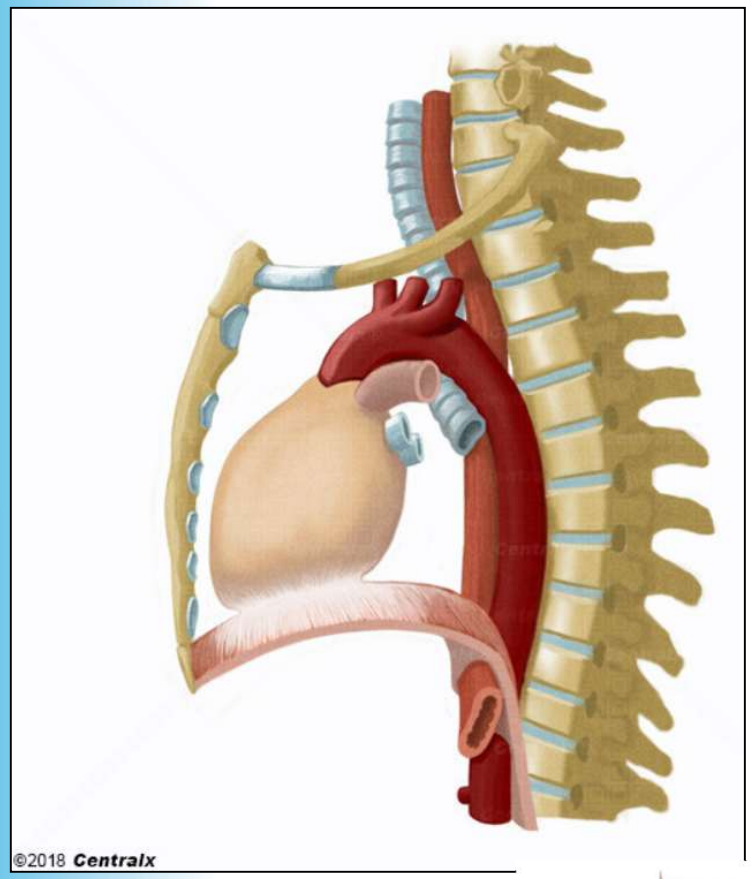
- 90%: progressief groeiende, pijnloze lymfeklieren, meestal boven middenrif
  - Hals
  - Oksel
  - Mediastinum



- Milt
- Abdominaal
- Beenmerg (5%): koorts van ongekende oorsprong

https://en.ghsg.org/symptoms
https://nl.dreamstime.com/stock-illustratie-diafragma-image43014604

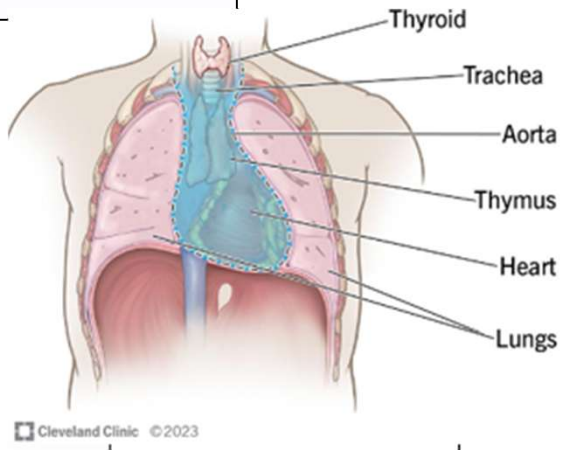
Symptomen



MEDIASTINUM

= ruimte tussen de twee longen

= bevat alle organen in de borskas behalve longen en longvliezen

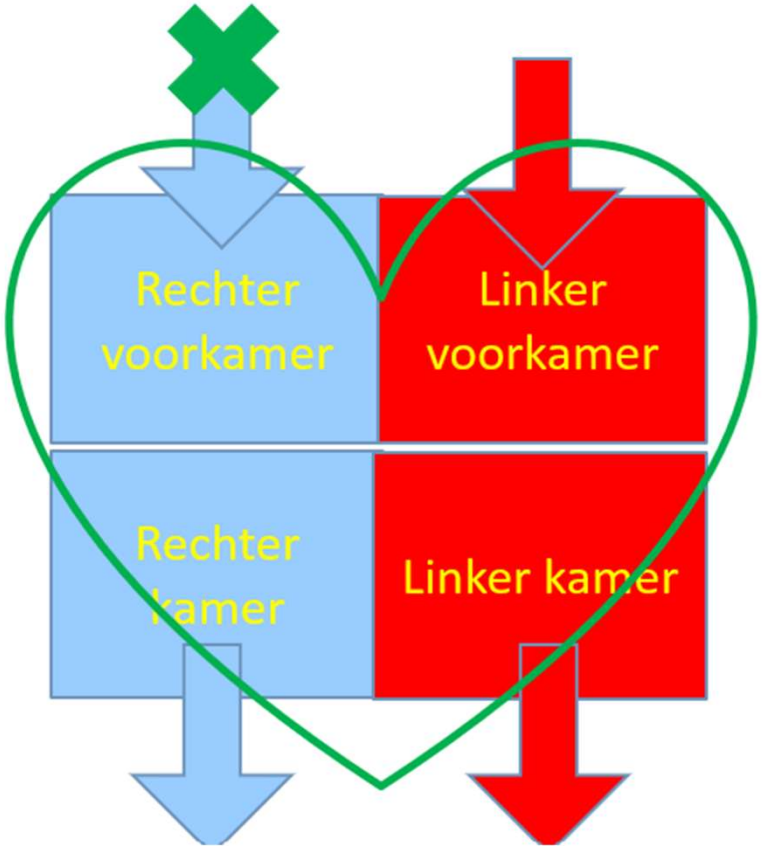


http://atlas.centralx.com/p/image/body-regions/thorax/thoracic-cavity/mediastinum/
https://my.clevelandclinic.org/health/diseases/13792-mediastinal-tumor

Symptomen

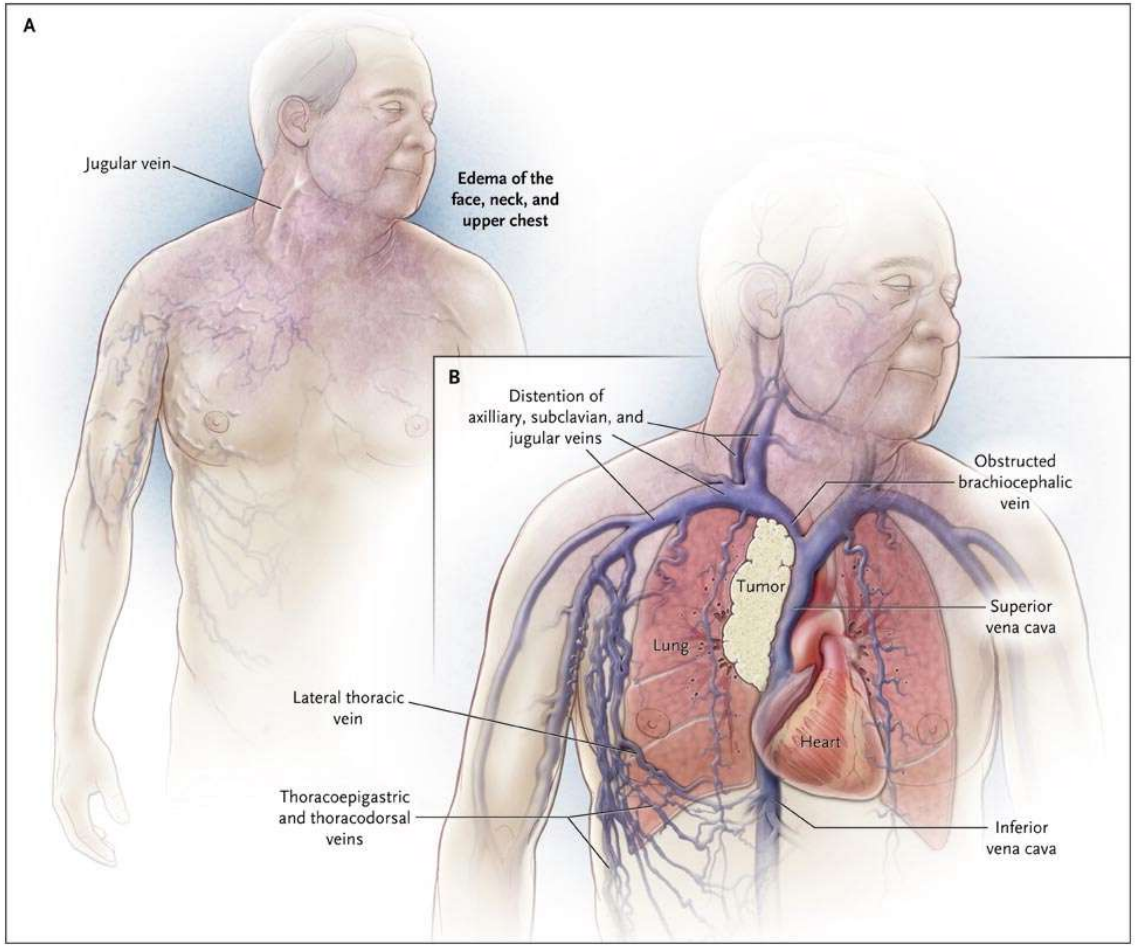
MEDIASTINALE AANTASTING

- Vaak laattijdig
- Initieel geen symptomen
- Hoest
- Kortademigheid
- Piepende ademhaling
- Vochtuitstorting hartvlies/longvlies
- Vena cava superior (bovenste holle ader) syndroom



Wang X, et al. Semin Diagn Pathol 2024;41:125-39

Symptomen



Vena cava superior syndroom

Kanani RS, Drachman E. N Engl J Med 2006;354:e7
Wilson LD, et al. N Engl J Med 2007;356:1862-69
Kumar B, Hosn NA. N Engl J Med 2014;371:1142

Symptomen

- Pijnloze lymfeklierzwelling (nodale aantasting)
- Symptomen mediastinale aantasting
- Orgaan (extranodale) aantasting: bv longen, beenmmerg
- B-symptomen (30-40%, vooral in gevorderd stadium)
  - *Koorts (onverklaard, > 38°C)*
  - *Excessief nachtzweten*
  - *Gewichtsverlies (niet-intentioneel, > 10% gewichtsverlies in 6 maand)*
- Vermoeidheid
- Veralgemeende jeuk
- Alcolholintolerantie

Armitage JO, et al. Lancet 2017;390:298-310

Biochemie

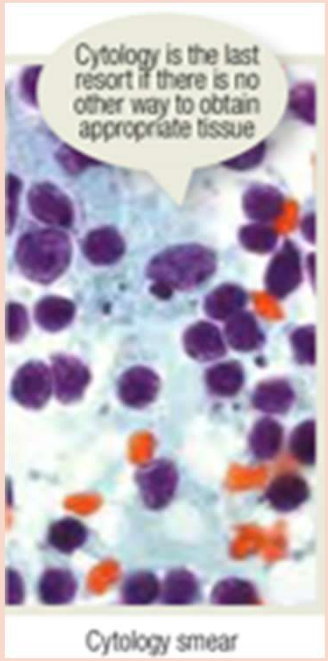
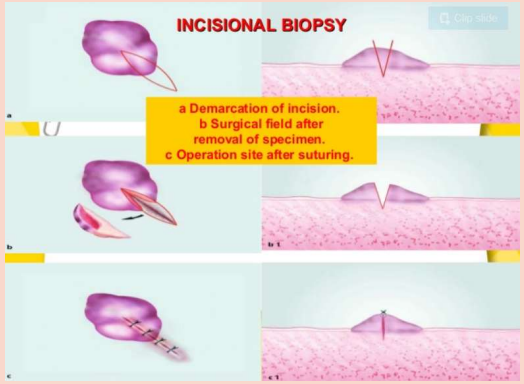
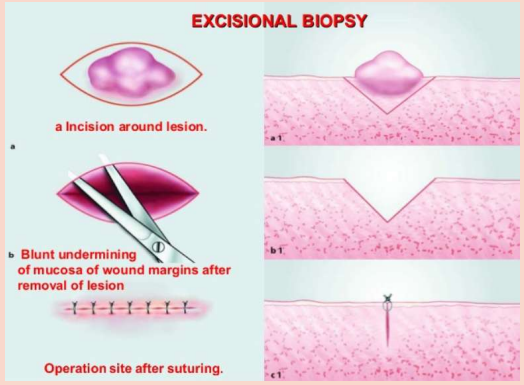
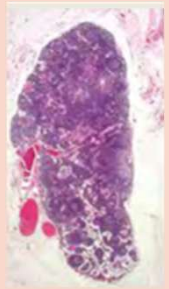
Niet-specifiek

- Verlaagde rode bloedcellen
- Verhoogde witte bloedcellen
- Verlaagde lymfocytose
- Eosinofilie
- Verhoogde bloedplaatjes
- Verhoogd CRP (C-reactief proteïne)
- Verhoogde sedimentatie

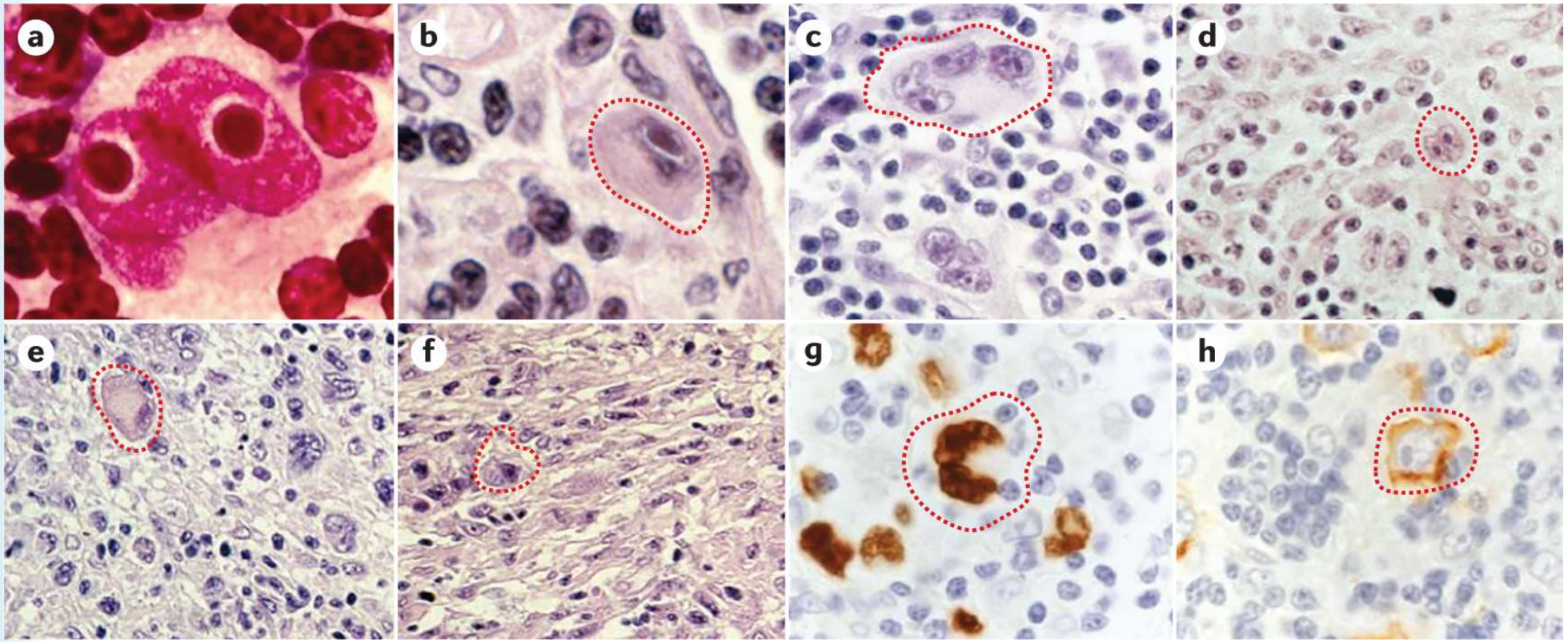
HEMATOLOGIE	
Hemoglobine	10.4
Hematocriet	0.326
RBC telling	4.26
MCV	76.5
MCH	24.4
MCHC	31.9
RDW	14.5
Reticulocyten	33
Immat. Retic	7.9
Erytroblasten	0.00
WBC telling	14.77
Bloedplaatjes	561
MPV	9.3
WBC differentiatie	
Neutrofielen	78.3
Eosinofielen	1.9
Basofielen	0.1
Lymfocyten	14.4
Monocyten	5.3
Stolling	
PT (sec)	13.6
PT (%)	70.0
PT (INR)	1.2
APTT	34.4
CHEMIE BLOED	
CRP	89.9

Diagnose

Gouden standaard

Punctie	Incisiebiopsie	Excisiebiopsie
  Cytology smear	 	 

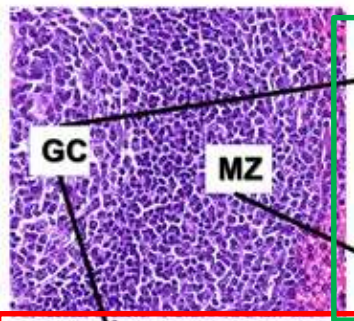
Diagnose



Connors JM, et al. Nat Rev Dis Primers 2020;6:61

Diagnose

NLPHL: nodulair predominant Hodgkin lymfoom
NLPBL: nodulair predominant B-cel lymfoom

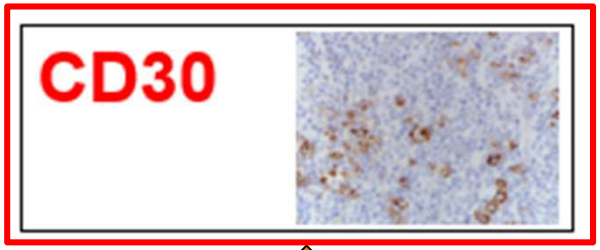


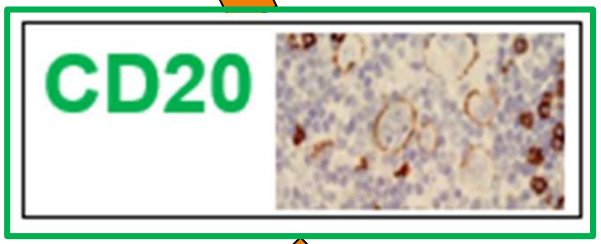
THCRBCL-like

NLPHL
LP cell phenotype:
CD30 —
CD15 —
MUM1/IRF4+
CD20 +
B-cell transcription factors +
EBV infection —

LRcHL
HRS cell phenotype:
CD30 +
CD15 +/—
MUM1/IRF 4+
CD20 —/+
B-cell transcription factors +/—
EBV infection —/+

cHL
HRS cell phenotype:
CD30 +
CD15 +
MUM/IRF41 +
CD20 usually —
B-cell transcription factors usually —
EBV infection —/+





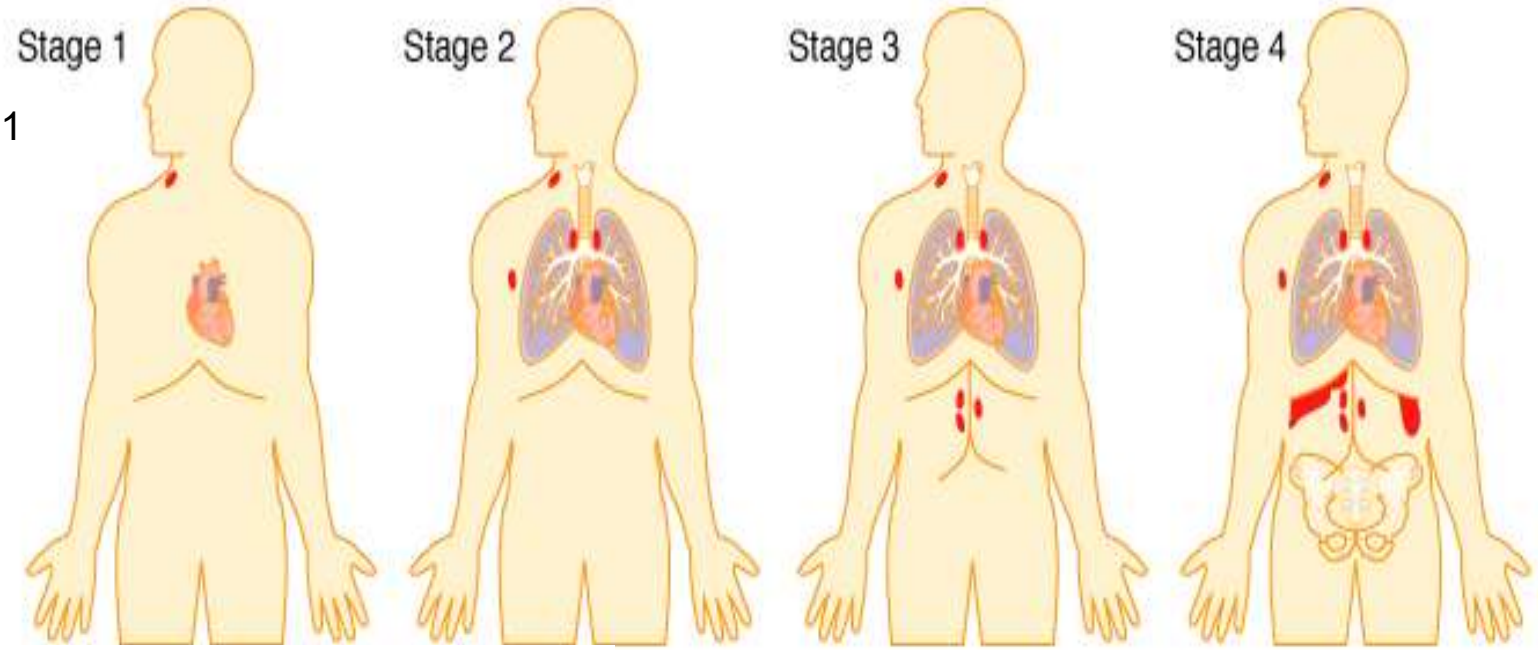
Biomarker	NSHL	MCHL	LDHL	LRHL	NLPHL
CD30	Positive	Positive	Positive	Positive	Negative
CD15	Usually positive (~80%)	Usually positive (~80%)	Usually positive (~80%)	Usually positive (~80%)	Negative
IRF4	Positive	Positive	Positive	Positive	Positive
CD20	Occasionally positive (~20%) with variable intensity	Occasionally positive (~20%) with variable intensity	Occasionally positive (~20%) with variable intensity	Occasionally positive (~20%) with variable intensity	Positive
PAX5	Positive	Positive	Positive	Positive	Positive
B cell transcription factors	Usually negative	Usually negative	Usually negative	Positive or negative	Positive
EBV	Positive (10–20%)	Positive (75%)	Positive (75%)	Positive (30%)	Negative

Connors JM, et al. Nat Rev Dis Primers 2020;6:61

Staging

Stadium IV:
meerdere extranodale haarden met al dan niet klierinvasie of 1 extranodale haard met klieren op afstand

Stadium I:
aantasting van 1 lymfonodus groep of 1 extranodale haard IE



Stadium II:
aantasting van meerdere lymfekliergroepen aan de zelfde kant van het diafragma
IIE: 1 extranodale haard samen met de regionale klier al dan niet met aantasting van andere klieren aan dezelfde kant van het diafragma

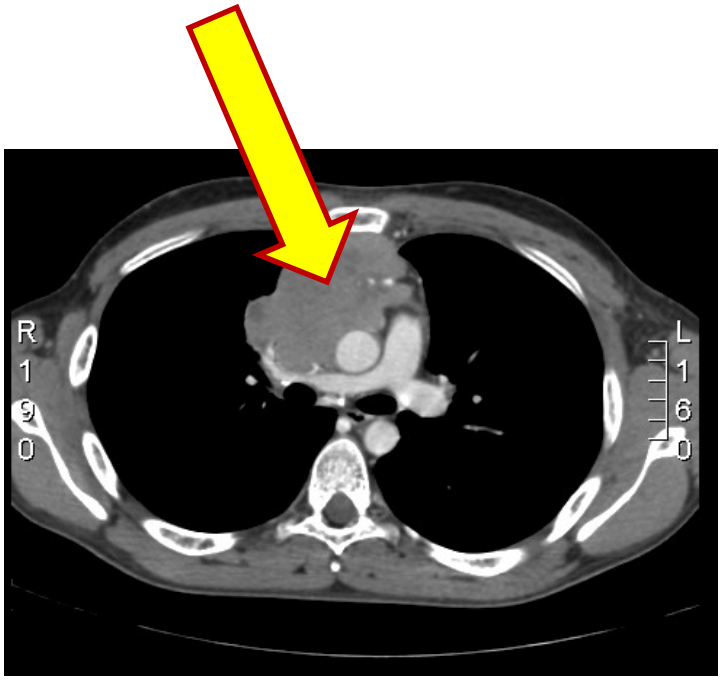
Stadium III:
aantasting van klieren aan de beide zijden van het diafragma (**III1-III2**)
IIIE: stad III met 1 extranodale haard
IIIS: stad III met aantasting van de milt

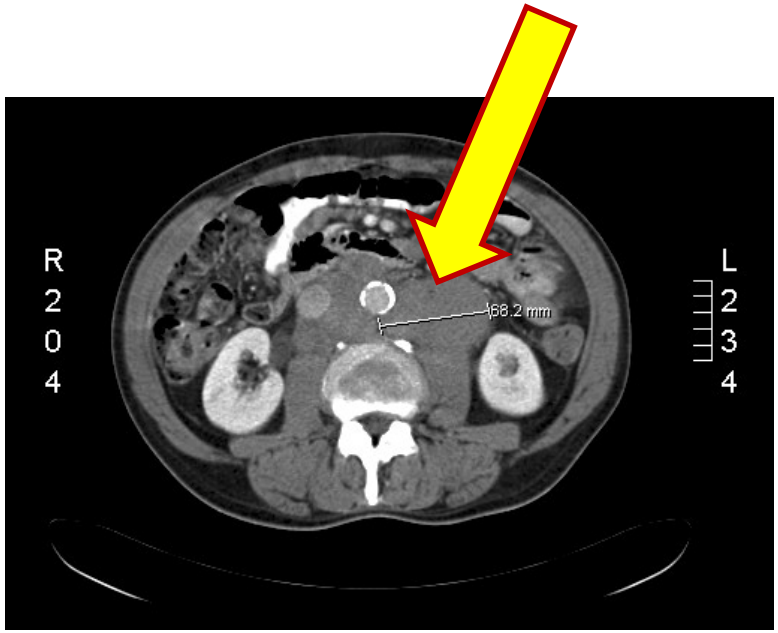
A: geen B-symptomen
B: B-symptomen

Staging

CT scan (computerized tomography)

Anatomisch detail

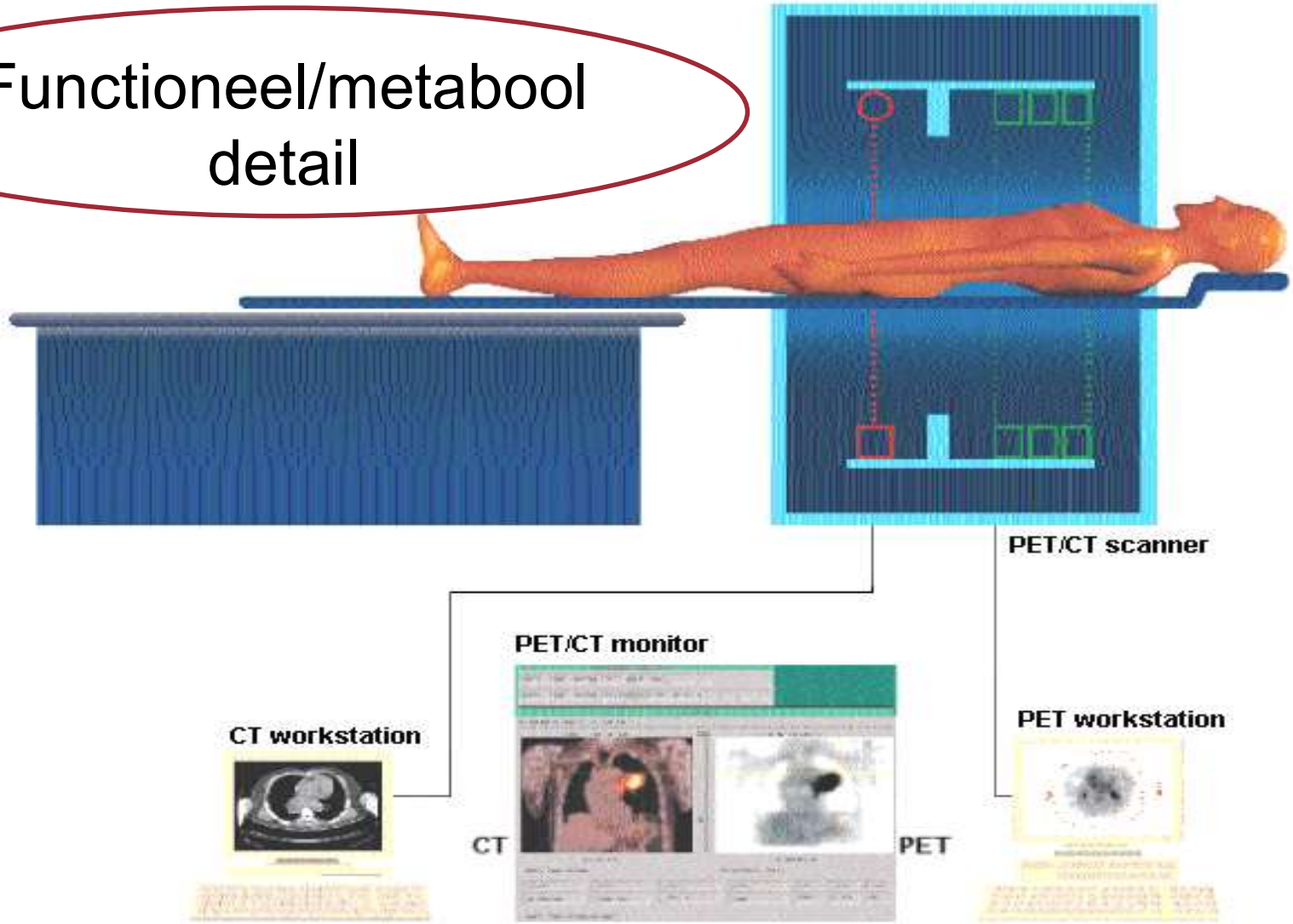




Staging

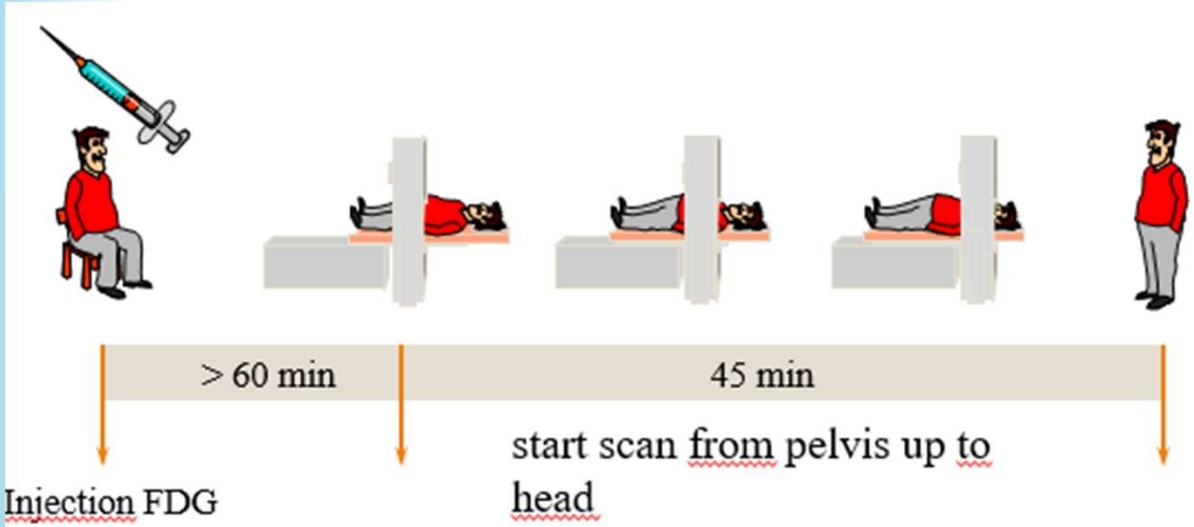
PET scan (positron emission tomograph)

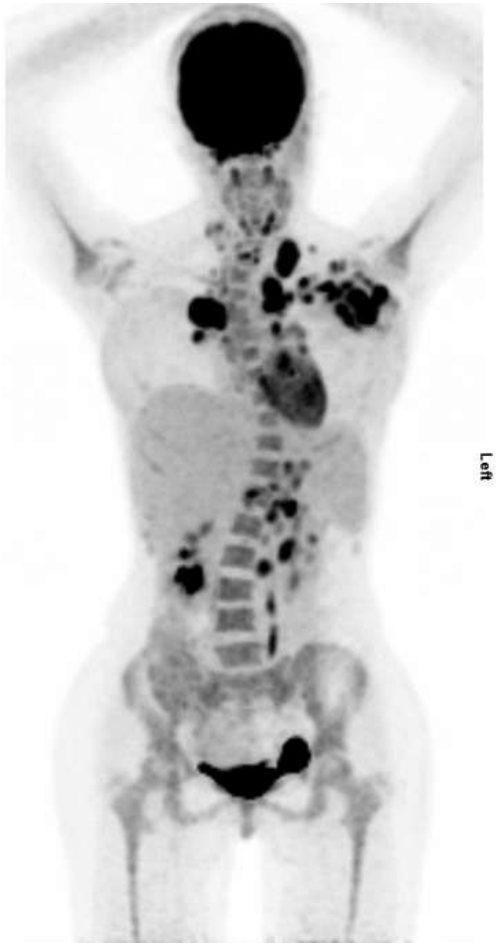
Functioneel/metabool detail



Staging

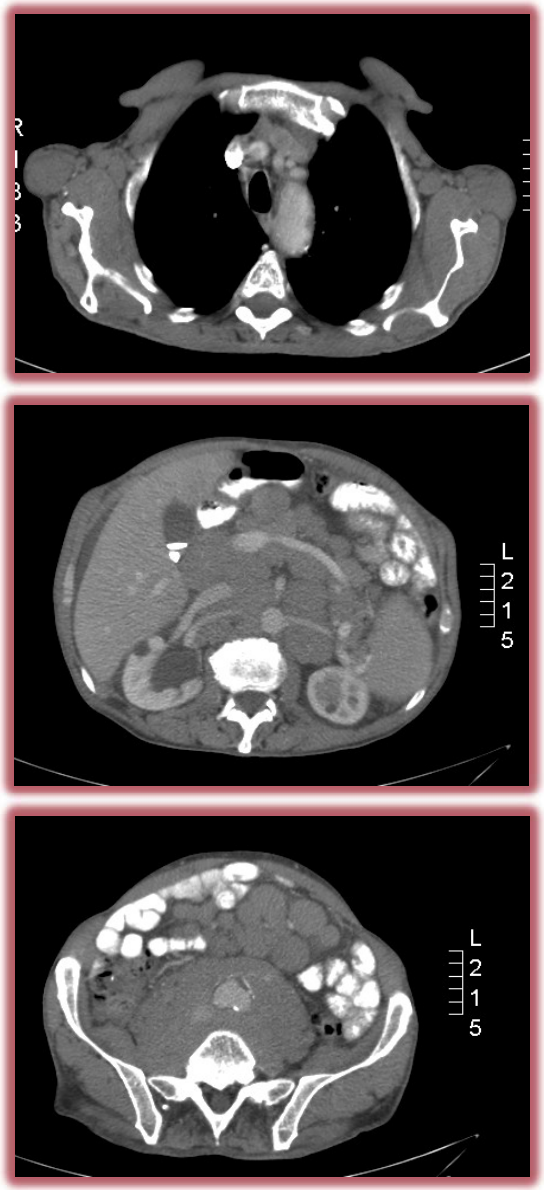
PET scan (positron emission tomography)

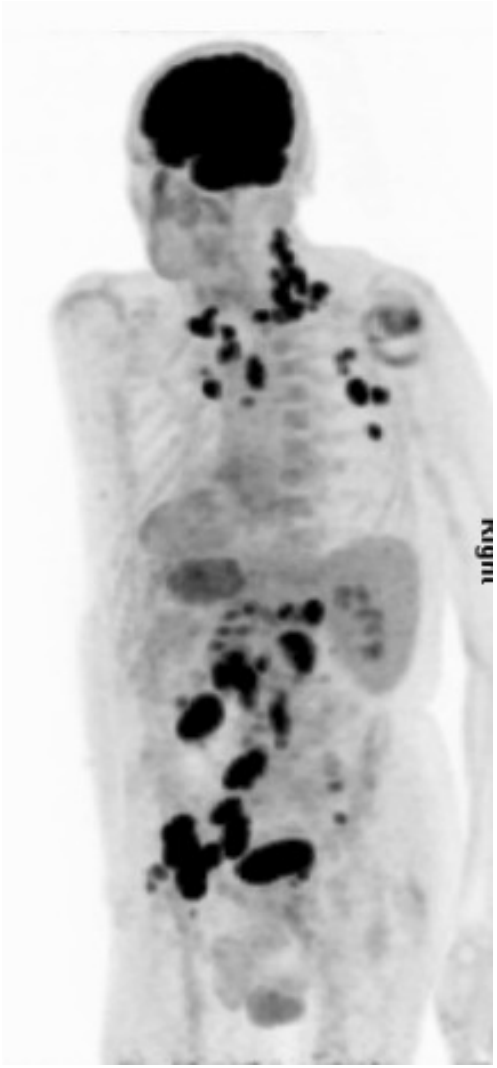




Staging

PET/CT scan





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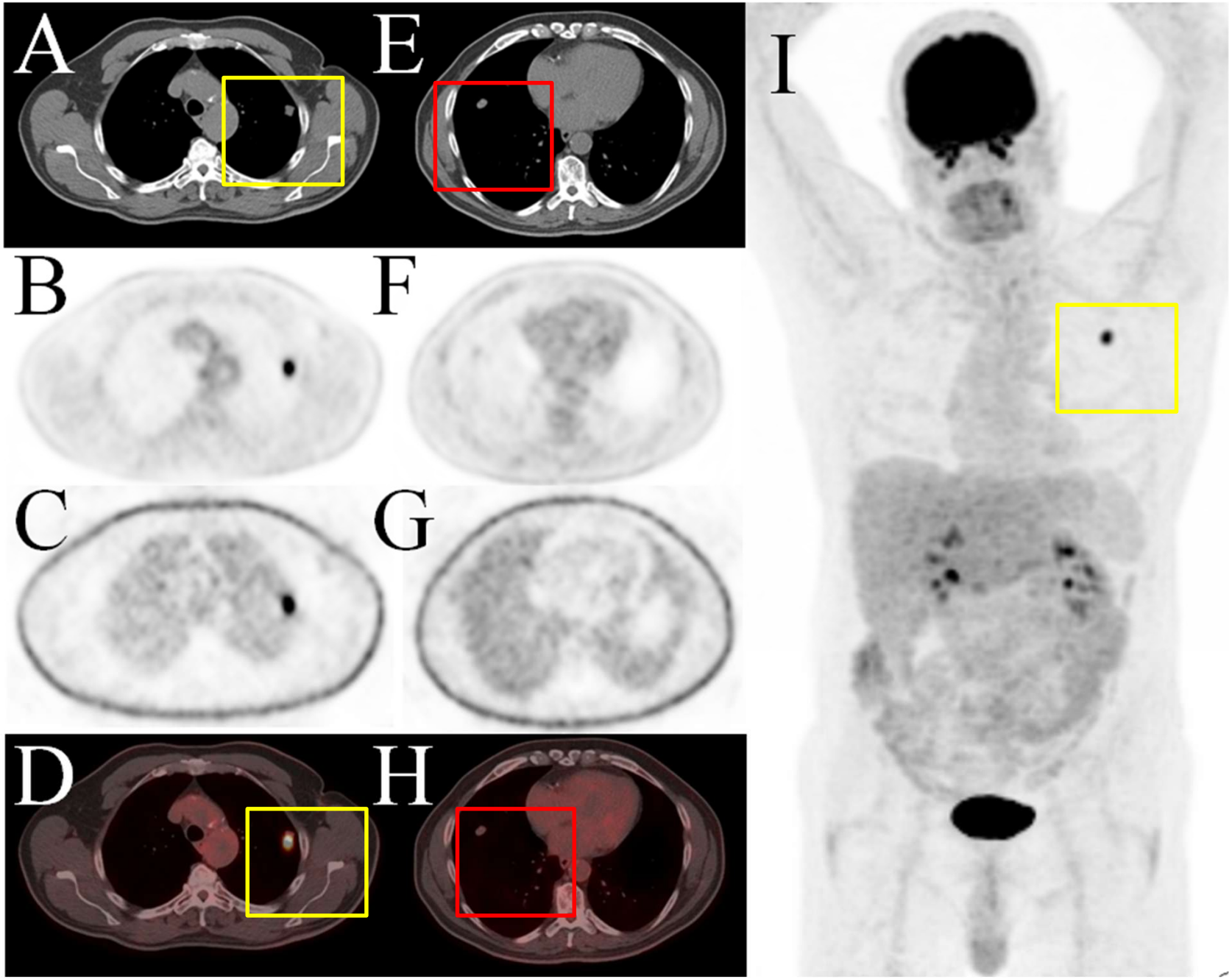
PET/CT scan



Evaluatie

- Performantiestatus
- Hepatitis B en C, HIV
- Echografie van het hart
- (Longfunctie-onderzoek)

ECOG PERFORMANCE STATUS*

Grade	ECOG
0	Fully active, able to carry on all pre-disease performance without restriction
1	Restricted in physically strenuous activity but ambulatory and able to carry out work of a light or sedentary nature, e.g., light house work, office work
2	Ambulatory and capable of all selfcare but unable to carry out any work activities. Up and about more than 50% of waking hours
3	Capable of only limited selfcare, confined to bed or chair more than 50% of waking hours
4	Completely disabled. Cannot carry on any selfcare. Totally confined to bed or chair
5	Dead

Oken MM, et al. Am J Clin Oncol 1982;5:649-55

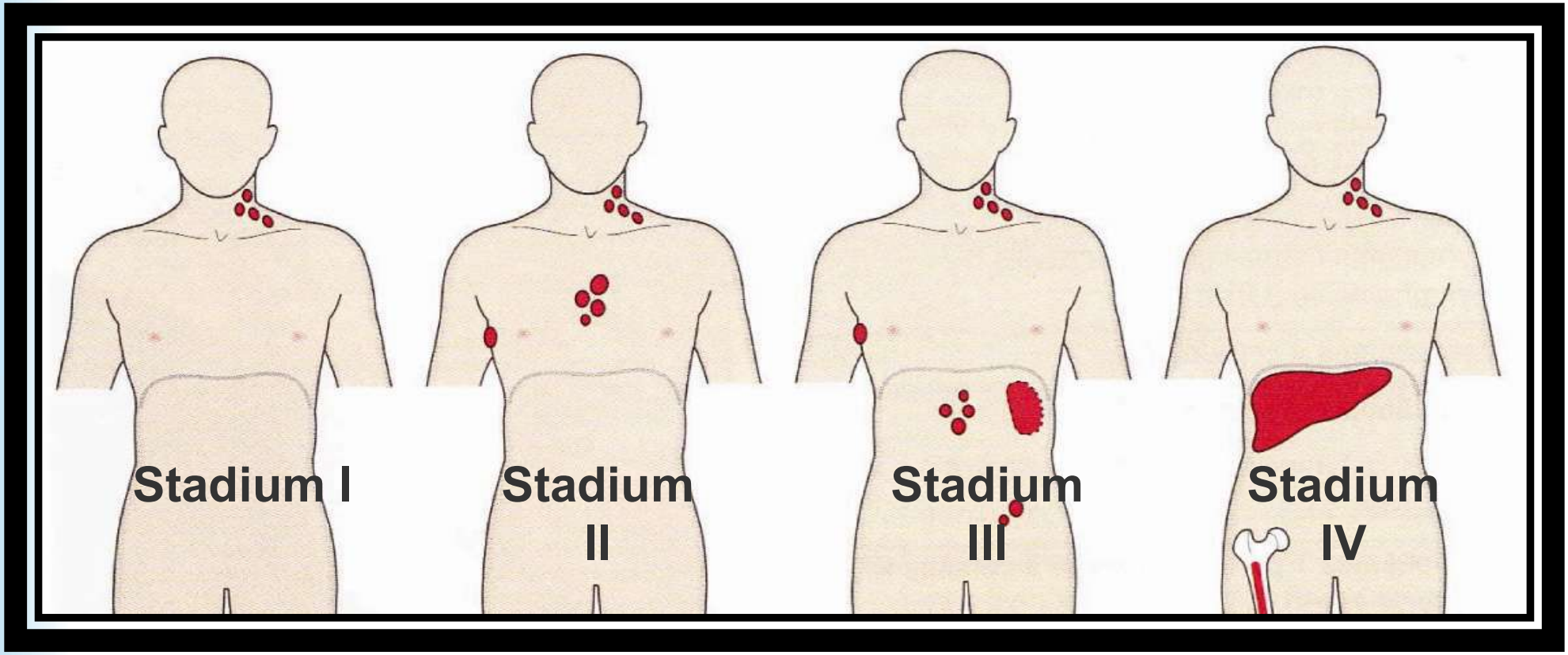
AYA aandachtspunten

Aandacht voor AYAs

- Genetische voorbeschiktheid?
- Fertiliteit!!
- Klinische studies?
- Psychosociale omkadering

16.10 – 16.40u: Zorg voor AYA's - mevr. Eline Van Roey van UZ Leuven
16.40u – 17.10 u: Angst voor herval - Klinisch psychologen Hannah De Messemaeker en Yaël Falise van UZ Leuven
17.10 tot 17.30u: Patiëntengetuigenis Eline

Behandeling



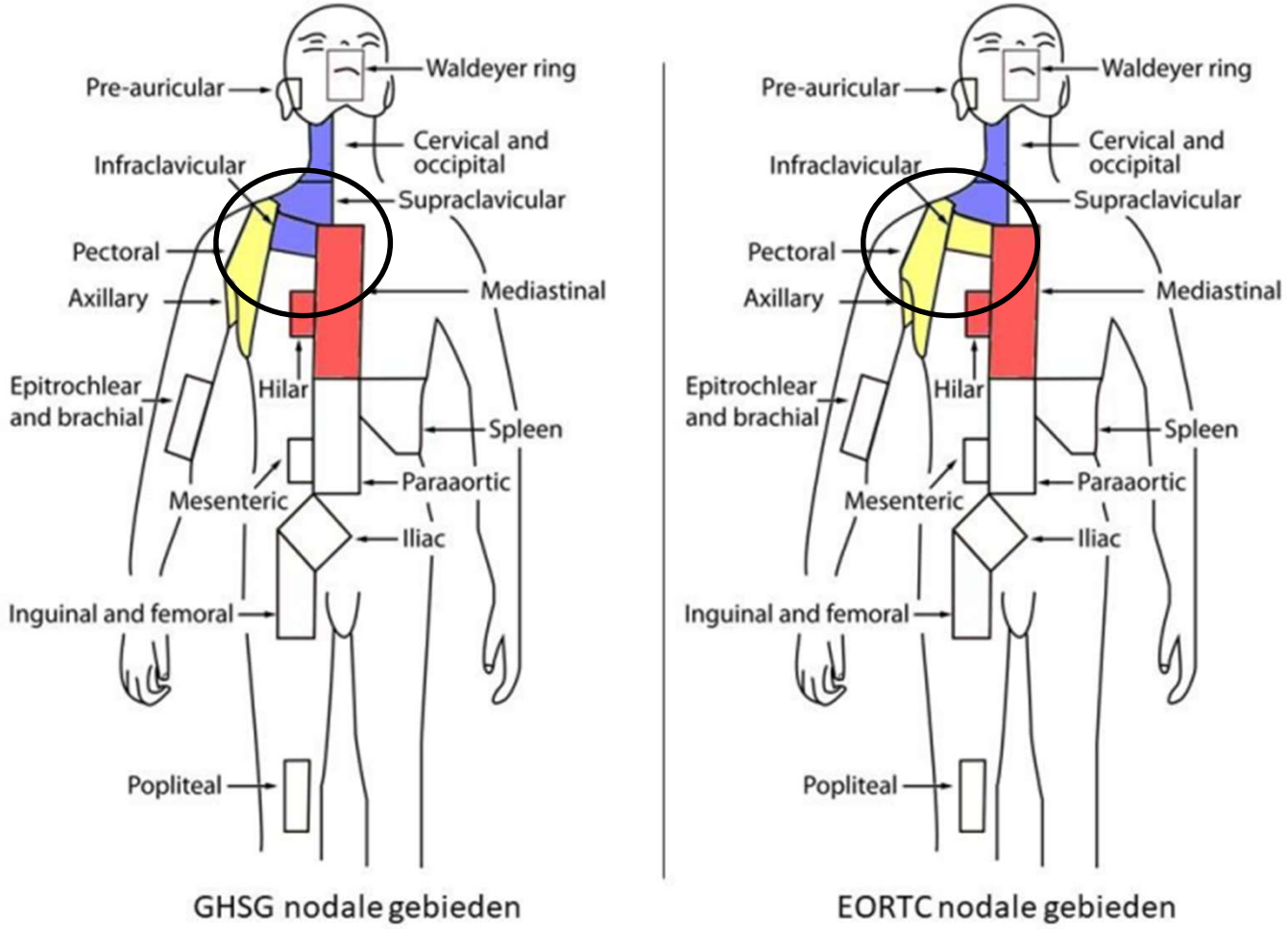
Beperkt stadium ("Early stage")	Gevorderd stadium ("Advanced stage")

Stadium IIB?
Bulky mediastinale massa?

Behandeling

Beperkt stadium

Figuur 1. Definitie lymfeklierregio's conform GHSG en EORTC



https://publicatie.hematologienederland.nl/wp-content/uploads/2022/12/Richtlijn-Hodgkin-lymfoom-HOVON-2019-v-2019.11.13.pdf

Behandeling

Beperkt stadium

1

Tabel 4. Risicoclassificatie conform GHSG

Risicofactor	Geen risicofactoren (early stage)	Wel risicofactoren (intermediate stage)
Bezinking/ B-symptomen	A + BSE < 50 mm	A + BSE ≥ 50 mm
	B + BSE < 30 mm	B + BSE ≥ 30 mm
	en	Of
MT ratio*	< 0.35	≥ 0.35
	en	Of
Aantal aangedane klier regios'#	2 of minder	3 of meer
	en	Of
Extranodale aantasting	afwezig	Aanwezig

*Breedte mediastinale tumor/ thorax diameter op niveau Th5 gemeten op staande X-Thorax

zie figuur 1 voor GHSG definities lymfeklierregio's

https://publicatie.hematologienederland.nl/wp-content/uploads/2022/12/Richtlijn-Hodgkin-lymfoom-HOVON-2019-v-2019.11.13.pdf

Behandeling

Beperkt stadium

2

Tabel 5. EORTC risico classificatie voor supradiafragmaa -II HL

Risicofactor	Geen risicofactoren (favorable)	Wel risicofactoren (unfavorable)
Leeftijd	< 50 jaar	≥ 50 jaar
	En	of
Bezinking/ B-symptomen	A + BSE < 50 mm	A + BSE ≥ 50 mm
	B + BSE < 30 mm	B + BSE ≥ 30 mm
	En	of
MT ratio*	< 0.35	≥ 0.35
	en	of
Aantal aangedane supra diafragmale klier regio's#	3 of minder	4 of meer

*Breedte mediastinale tumor/ thorax diameter op niveau Th5 gemeten op staande X-Thorax

zie figuur voor EORTC definities

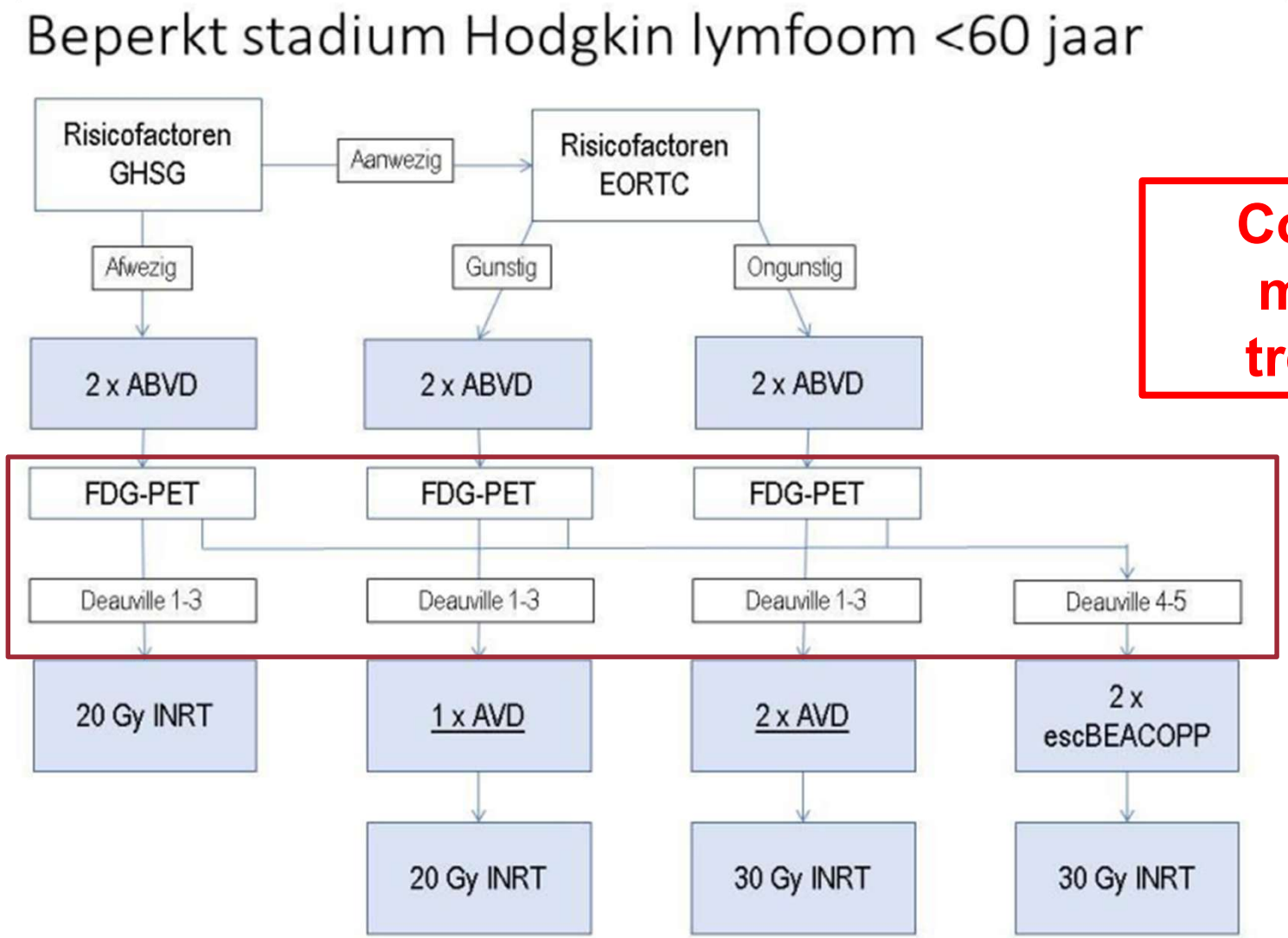
A: afwezigheid van B-symptomen

B: aanwezigheid van B-symptomen

https://publicatie.hematologienederland.nl/wp-content/uploads/2022/12/Richtlijn-Hodgkin-lymfoom-HOVON-2019-v-2019.11.13.pdf

Behandeling

Beperkt stadium



Combined modality treatment

https://publicatie.hematologienederland.nl/wp-content/uploads/2022/12/Richtlijn-Hodgkin-lymfoom-HOVON-2019-v-2019.11.13.pdf

Behandeling

Gevorderd stadium

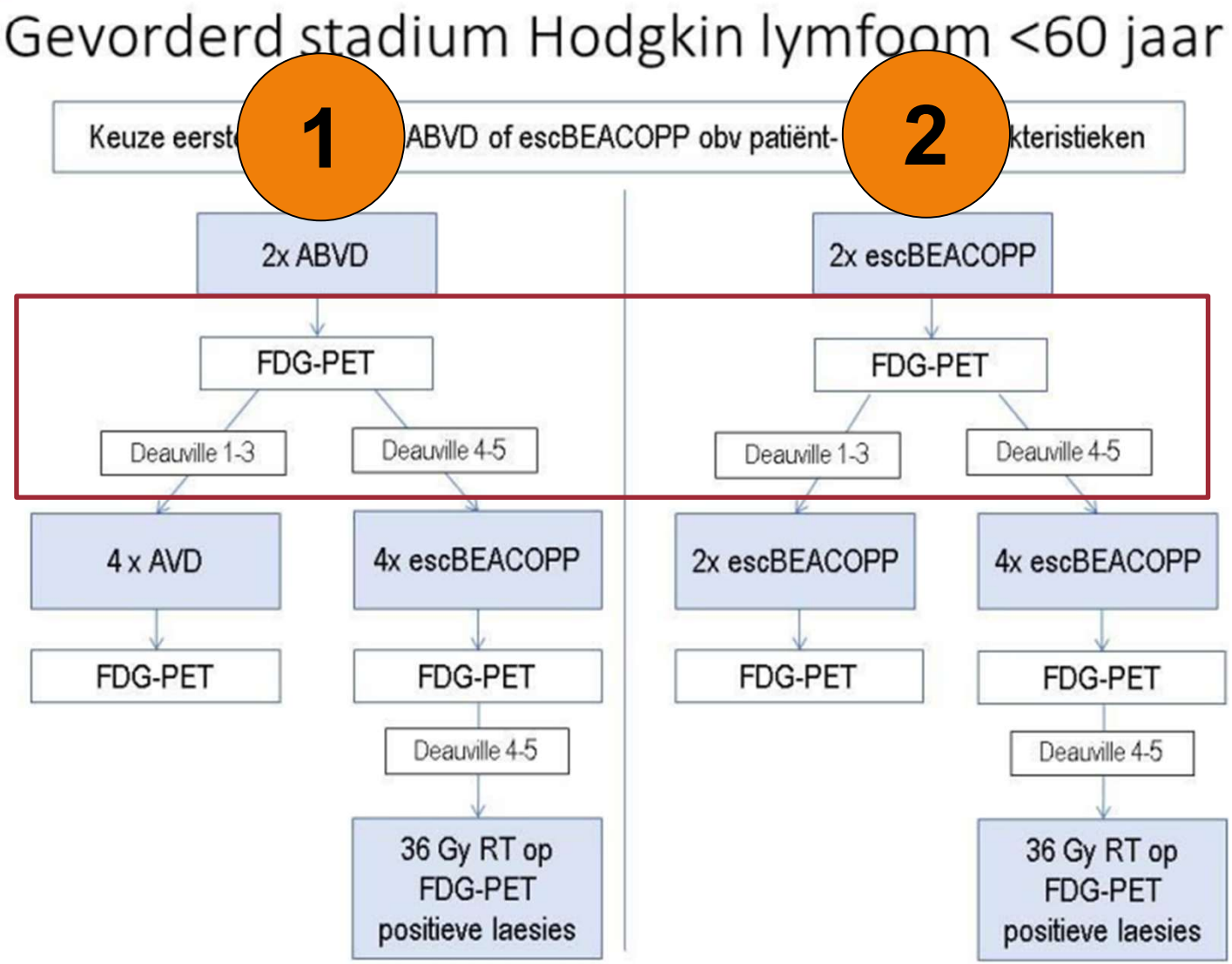
Tabel 6: International prognostic score (IPS).

Factoren	Punten
leeftijd 45 of ouder	1
Man	1
stadium IV	1
Hb < 10.5 g/dl (6.5 mmol/l)	1
albumine < 40 g/l	1
leukocyten > 15 x 10^9/l	1
lymfocyten < 0.6 x 10^9/l of < 8%	1

https://publicatie.hematologienederland.nl/wp-content/uploads/2022/12/Richtlijn-Hodgkin-lymfoom-HOVON-2019-v-2019.11.13.pdf

Behandeling

Gevorderd stadium



Geen bestraling

https://publicatie.hematologienederland.nl/wp-content/uploads/2022/12/Richtlijn-Hodgkin-lymfoom-HOVON-2019-v-2019.11.13.pdf

Behandeling

Leeftijd > 60 jaar

Leeftijd	Stadium	Behandeladvies
60 - 70 jaar en fit,	Beperkt	conform <60 jaar zonder escalatie naar escBEACOPP
	Gevorderd	conform <60 jaar met start van ABVD zonder escalatie naar escBEACOPP
≥70 jaar of 60-70 jaar en niet fit:	Beperkt	3x CHOP-21 + IN-RT
	Gevorderd	6x CHOP-21 + radiotherapie op PET-positieve laesies aan einde chemotherapie

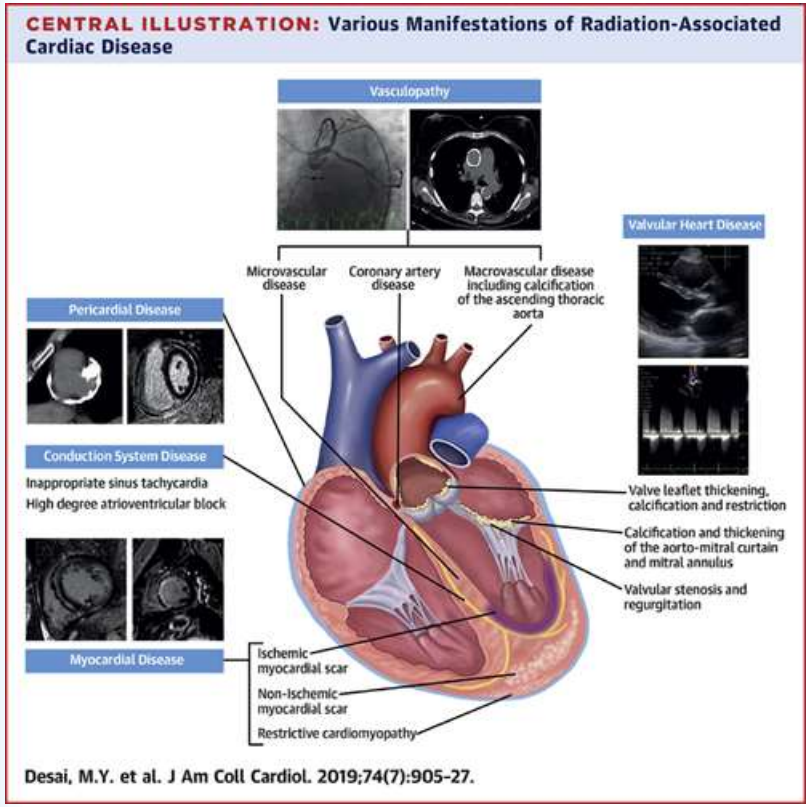
Afhankelijk van fitheid

https://publicatie.hematologienederland.nl/wp-content/uploads/2022/12/Richtlijn-Hodgkin-lymfoom-HOVON-2019-v-2019.11.13.pdf

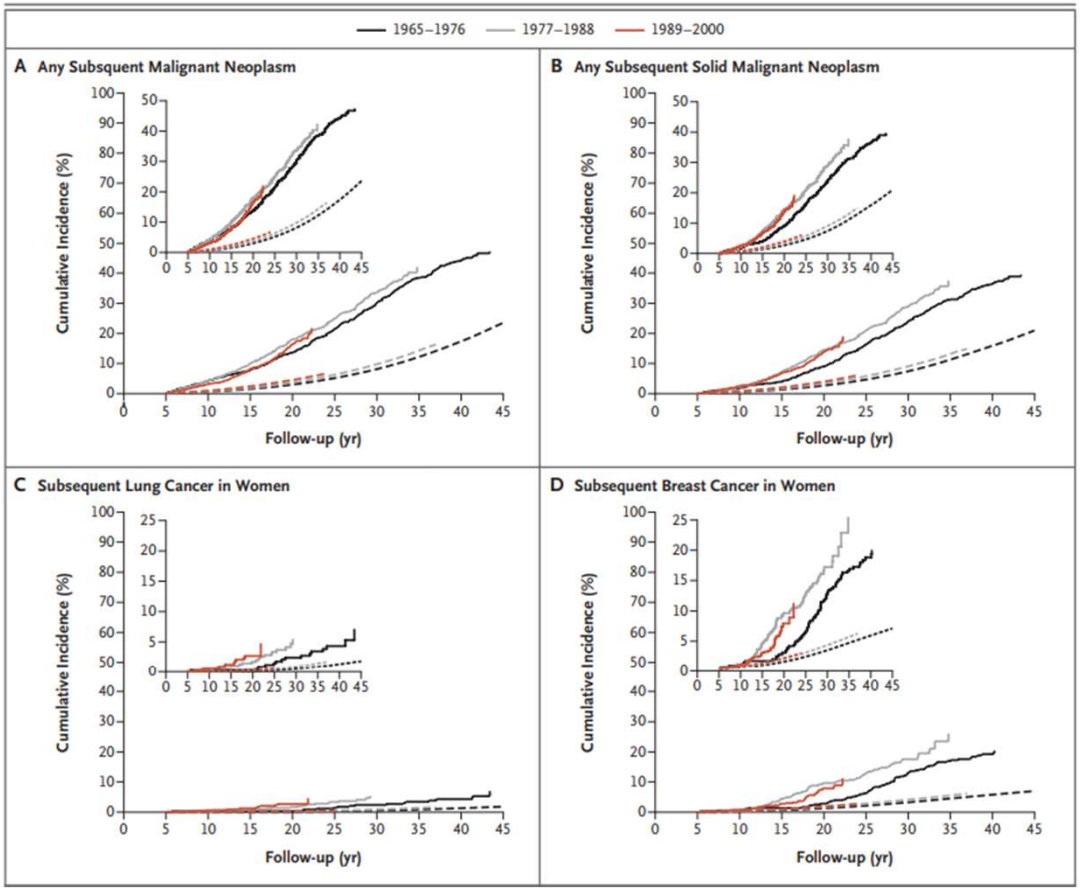
Behandeling

Is radiotherapie nodig?

Hartziekten



Secundaire kankers



Schaapveld M, et al. N Engl J Med 2015;373:2499-511
Desai MY, et al. J Am Coll Cardiol 2019;74:905-27

Behandeling

Is radiotherapie nodig?

Studies in beperkt stadium

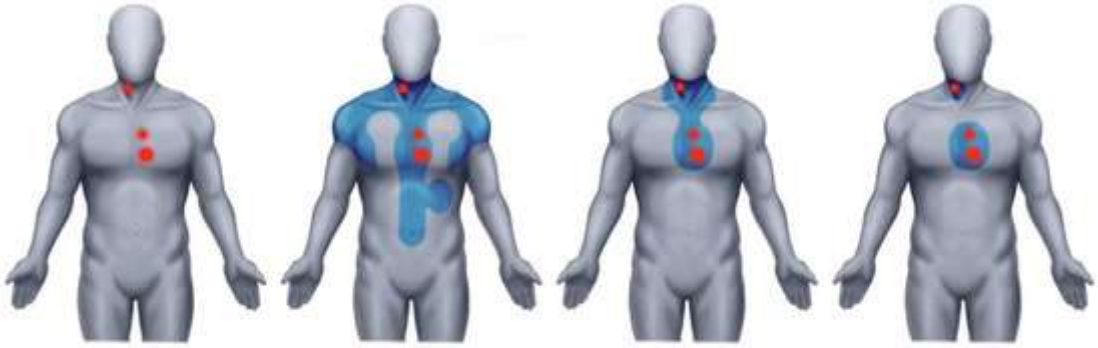
Weglaten radiotherapie bij negatieve interim PET/CT scan:

- Licht verminderde progressie-vrije overleving
- Geen verschil in algemene overleving

Raemakers JM, et al. J Clin Oncol 2014:32:2288-94
Radford J, etal. N Engl J Med 2015;372:1598-607

Behandeling

Evolutie radiotherapie

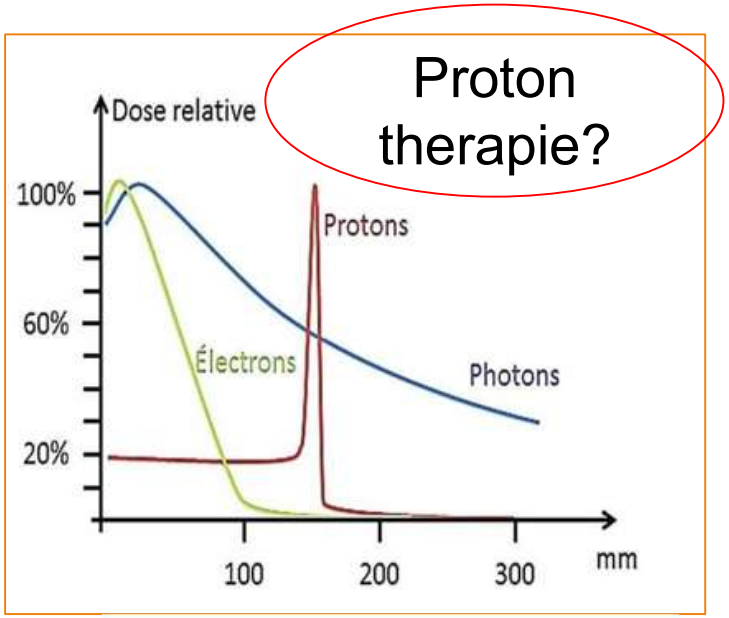


(A)

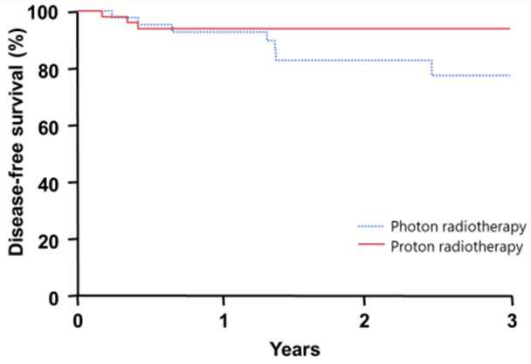
Mantel-veld

Involved field

Involved node



RT Fields	Years	Dose (Gy)	Technique	Planning Methods	Machines
EFRT	1960-1990	40-44	2D RT	2D planning	Cobalt Units; first LINACS
IFRT	1995-2005	30-36	3D-CRT	3D Planning	
			Static-IMRT	Forward/Inverse planning	LINAC with Multileaf Collimator
ISRT/INRT	2005-present	20-30	Static IMRT	Inverse Planning	LINAC with Multileaf Collimator
			Arc-therapy	Biologic Optimization	LINAC with Dinamic MLC and Image-Guidance
			Tomotherapy	Multimodality Imaging	Volumetric Modulated Arc Therapy
				Dose Painting	Helical Tomotherapy
				Image-Guided Radiotherapy	



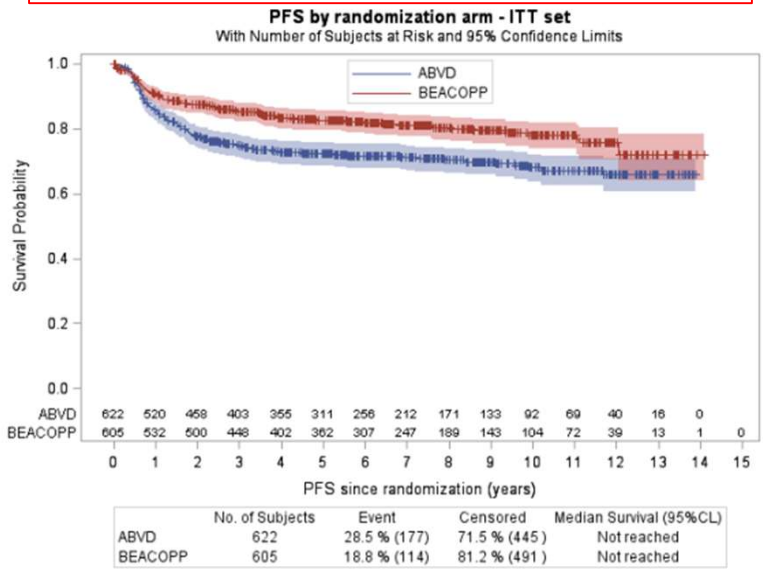
Ricardoi U, et al. Mediterr J Hematol Infect Dis 2014;6:e2014035
Witkowska M, et al. Biomed Res Int 2015;2015:485071
Bates JE, et al. Int J Part Ther 2021;8:21-7
Eich HT, et al. Lymphatics 2023;1:262-72

Behandeling

Verschil ABVD en escBEACOPP

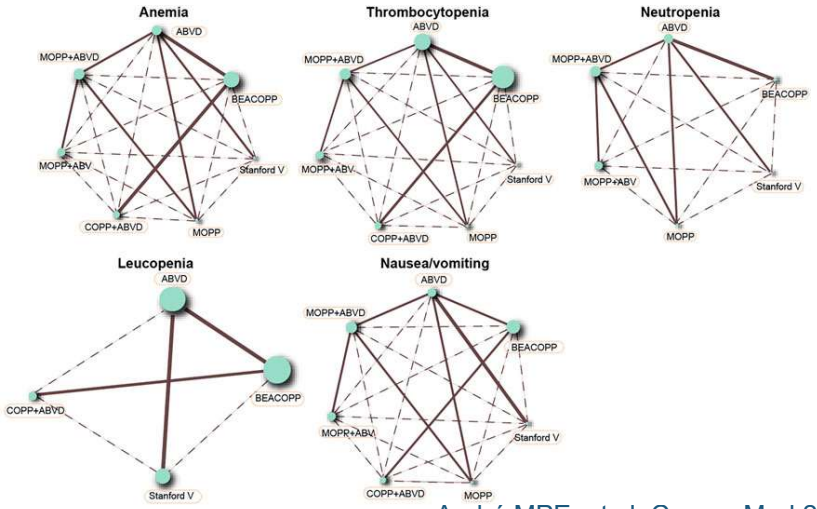
ABVD (every 28 d)	Doxorubicin 25 mg/m²/dose IV on days 1 and 15
	Bleomycin 10 units/m²/dose IV on days 1 and 15
	Vinblastine 6 mg/m²/dose IV on days 1 and 15
	Dacarbazine (DTIC) 375 mg/m²/dose IV on days 1 and 15
Dose-escalated BEACOPP (every 3 wk)	Bleomycin 10 international units/m² IV on day 8
	Etoposide (VP-16) 200 mg/m² IV on days 1–3
	Doxorubicin (Adriamycin) 35 mg/m² on day 1
	Cyclophosphamide (Cytoxan) 1,200 mg/m² on day 1
	Vincristine 1.4 mg/m² (max 2 mg) on day 8
	Procarbazine 100 mg/m² PO on days 1–7
	Prednisone 40 mg/m² PO on days 1–14
	Filgrastim (G-CSF) support is needed

Efficiëntie



	No. of Subjects	Event	Censored	Median Survival (95%CL)
ABVD	622	28.5 % (177)	71.5 % (445)	Not reached
BEACOPP	605	18.8 % (114)	81.2 % (491)	Not reached

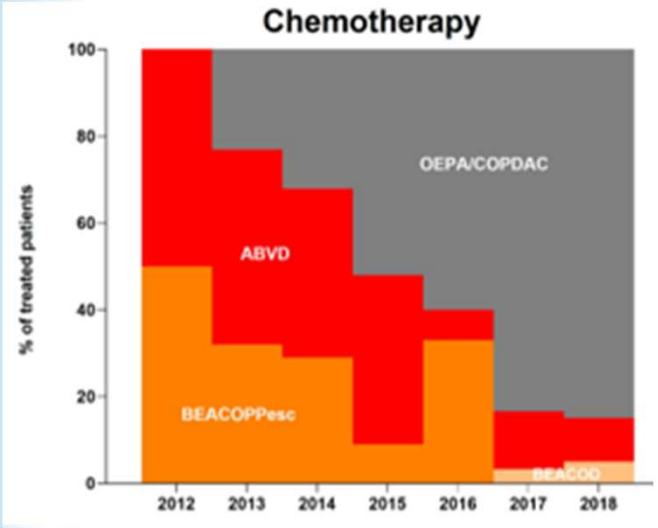
Nevenwerkingen

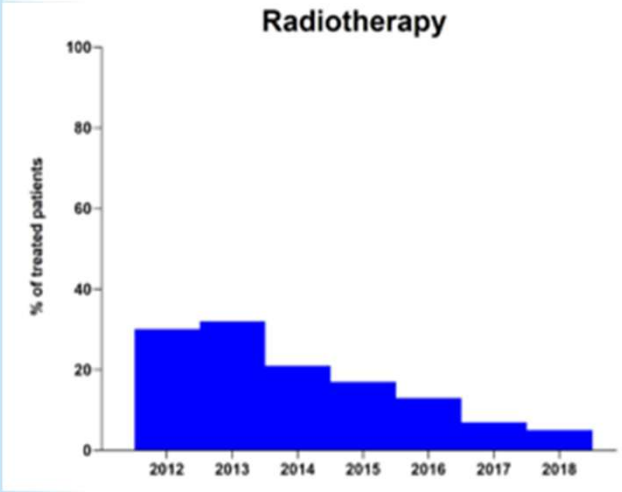


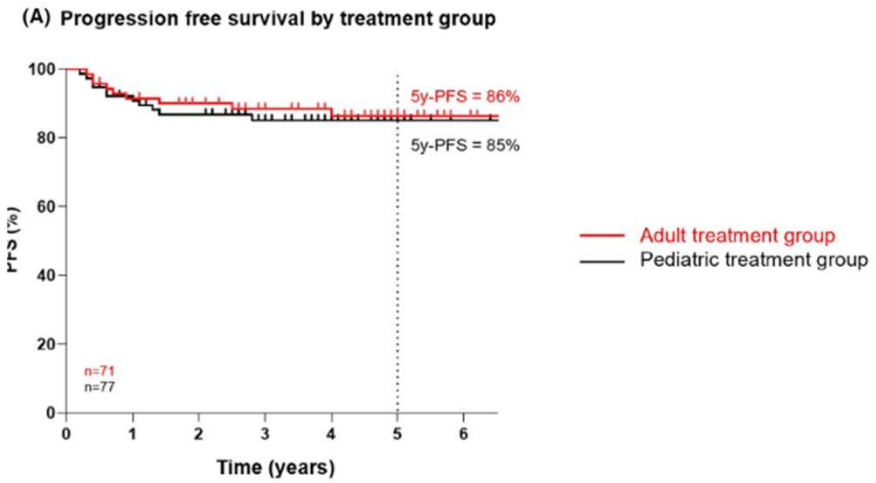
André MPE, et al. Cancer Med 2020;9:6565-75
Pei F, et al. Front Pharmacol 2021;12:694545

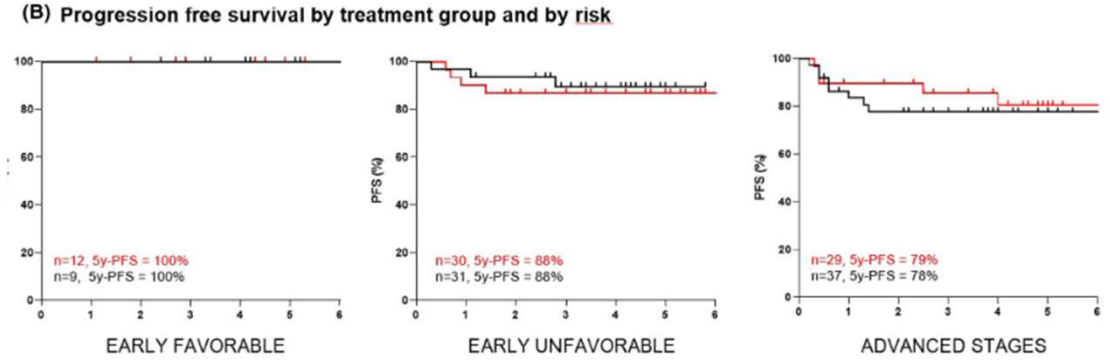
Behandeling

AYA: pediatrisch of volwassen schema?





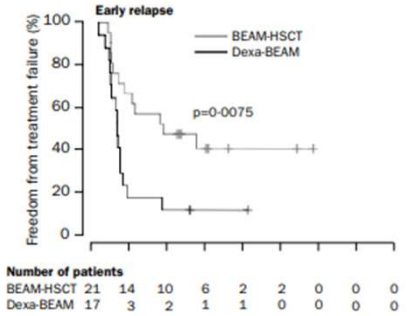


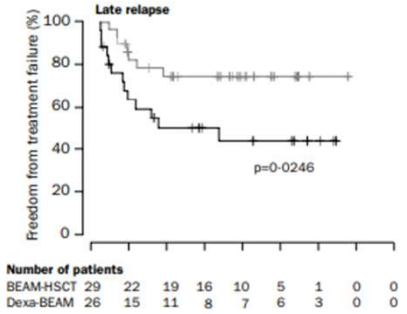


Lew-Derivry L, et al. Br J Haematol 2025;206:907-18

Behandeling

Herval





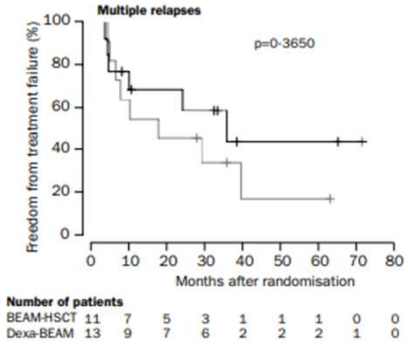


Figure 4: **Freedom from treatment failure for patients with early relapse (upper), late relapse (middle), and multiple relapses (lower) of Hodgkin's disease**

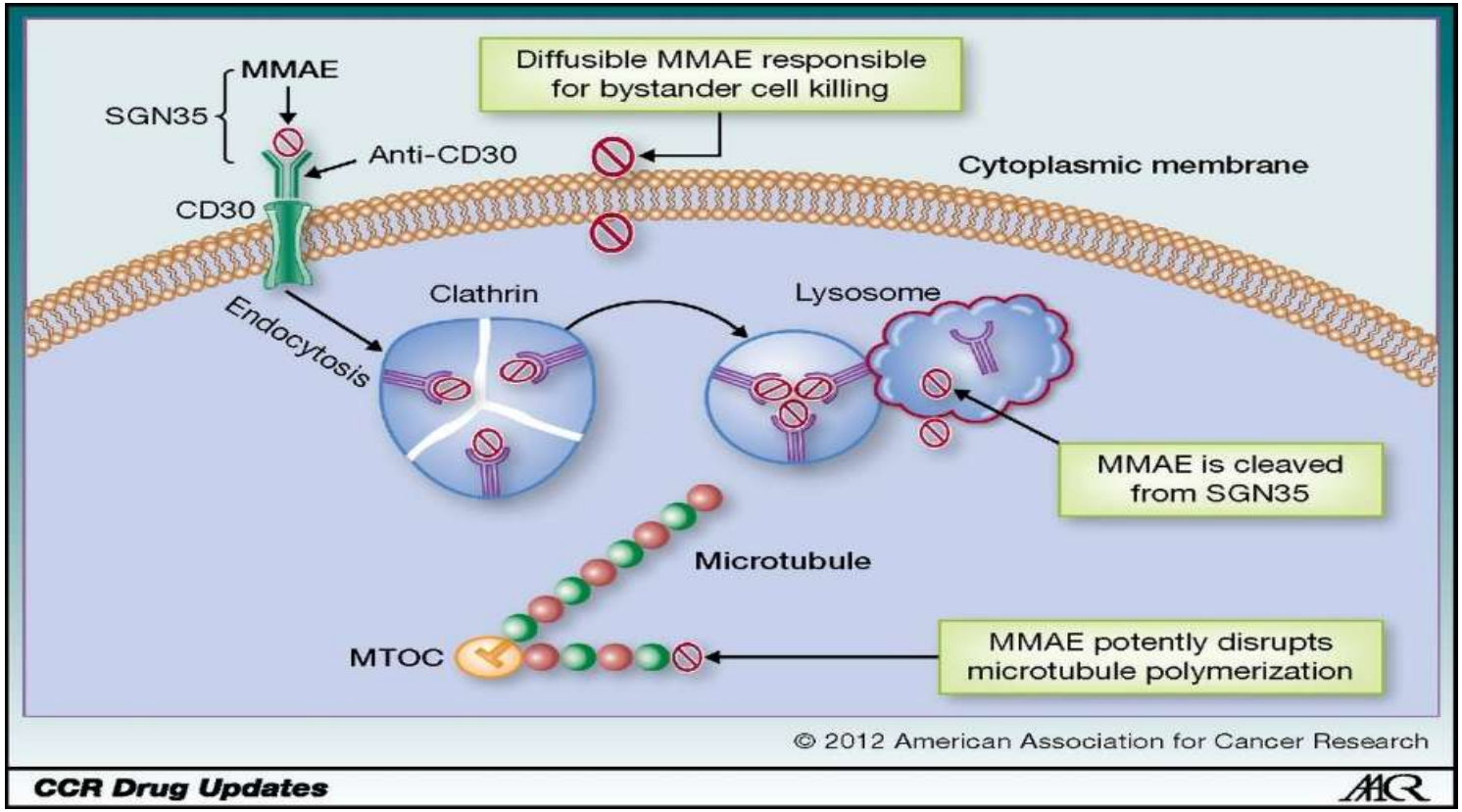
Hoge dosis chemotherapie gevolgd door autologe stamceltransplantatie

Schmitz N, et al. Lancet 2002;359:2065-71

Behandeling

Immuuntherapie

Anti-CD30 monoclonale antistof ('antibody-drug conjugate'):
Brentuximab vedotin



Deng C, et al. Clin Cancer Res 2012;19:22-27

Behandeling

Immuuntherapie: BV met AVD ipv ABVD

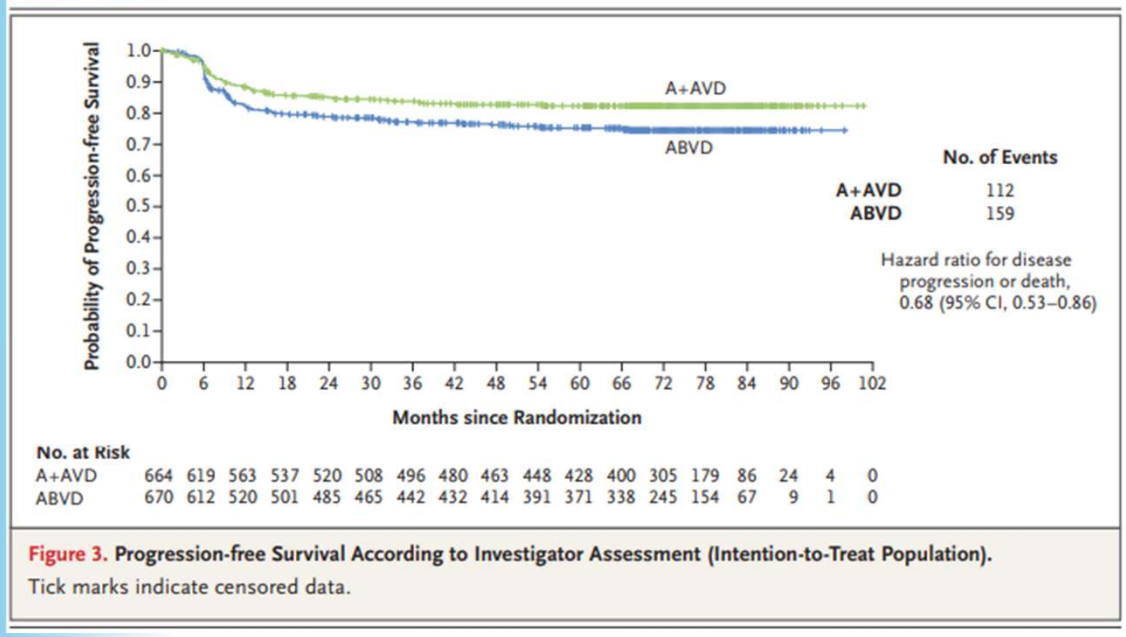


Figure 3. Progression-free Survival According to Investigator Assessment (Intention-to-Treat Population).
Tick marks indicate censored data.

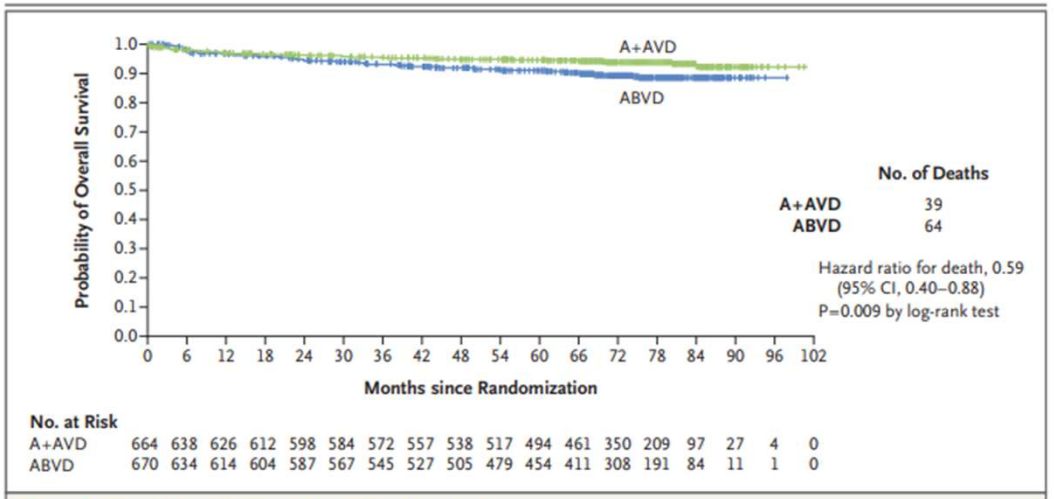


Figure 1. Overall Survival (Intention-to-Treat Population).
The intention-to-treat population included all the patients who underwent randomization. Tick marks indicate censored data. A+AVD denotes brentuximab vedotin plus doxorubicin, vinblastine, and dacarbazine; and ABVD doxorubicin, bleomycin, vinblastine, and dacarbazine.

Polyneuropathie

Ansell SM, et al. N Engl J Med 2022;387:310-20

Behandeling

Immuuntherapie: BrECADD ipv escBEACOPP

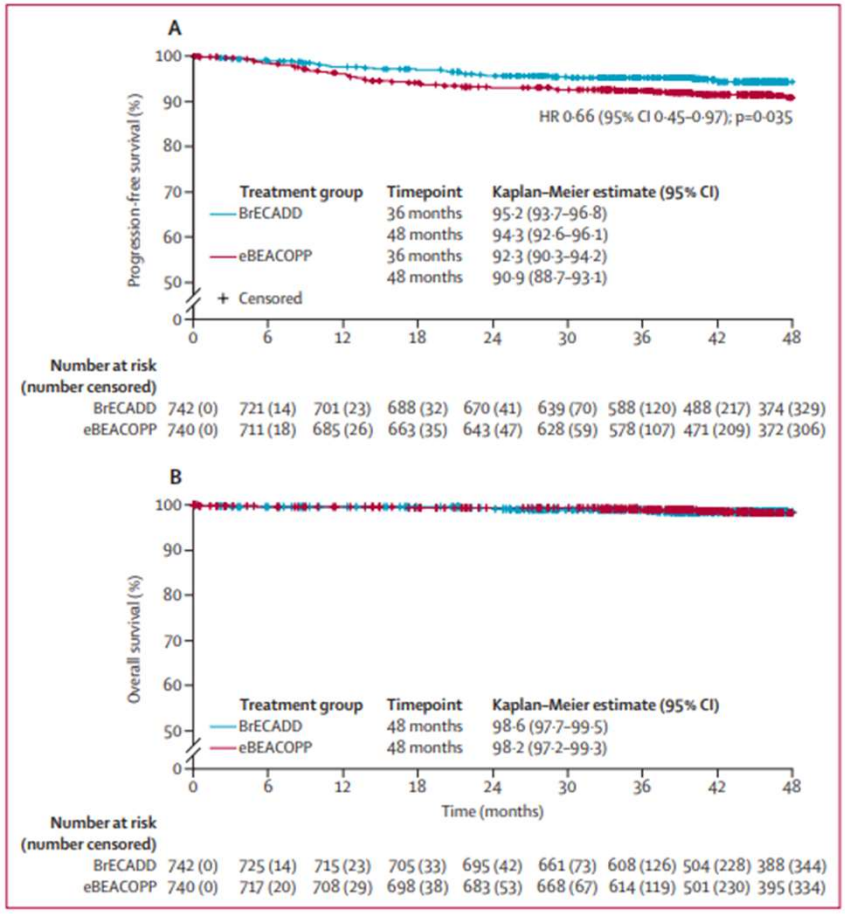


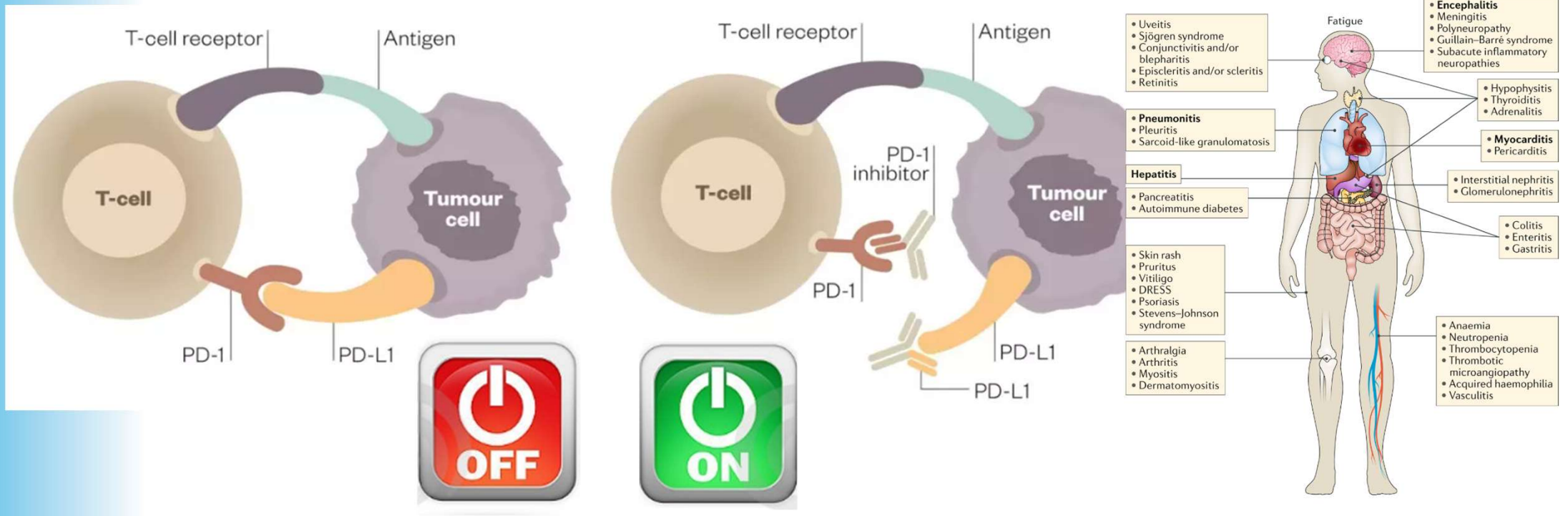
Figure 2: **Kaplan–Meier estimates of progression-free survival and overall survival**
Progression-free survival (A) and overall survival (B). HR and p value obtained by Cox regression stratified by area of recruitment, International Prognostic Score, age, and sex. BrECADD=brentuximab vedotin, etoposide, cyclophosphamide, doxorubicin, dacarbazine, and dexamethasone. eBEACOPP=escalated doses of bleomycin, etoposide, doxorubicin, cyclophosphamide, vincristine, procarbazine, and prednisone. HR=hazard ratio.

Borchmann P, et al. Lancet 2024;404:341-52

Behandeling

Immuuntherapie

Checkpoint inhibitoren:
Nivolumab en Pembrolizumab



https://pharmaceutical-journal.com/article/feature/immune-checkpoint-inhibitors-bring-new-hope-to-cancer-patients

Martins F, et al. Nat Rev Clinical Oncol 2019;16:563-80

Behandeling

Immuuntherapie: Nivolumab-AVD *versus* BV-AVD

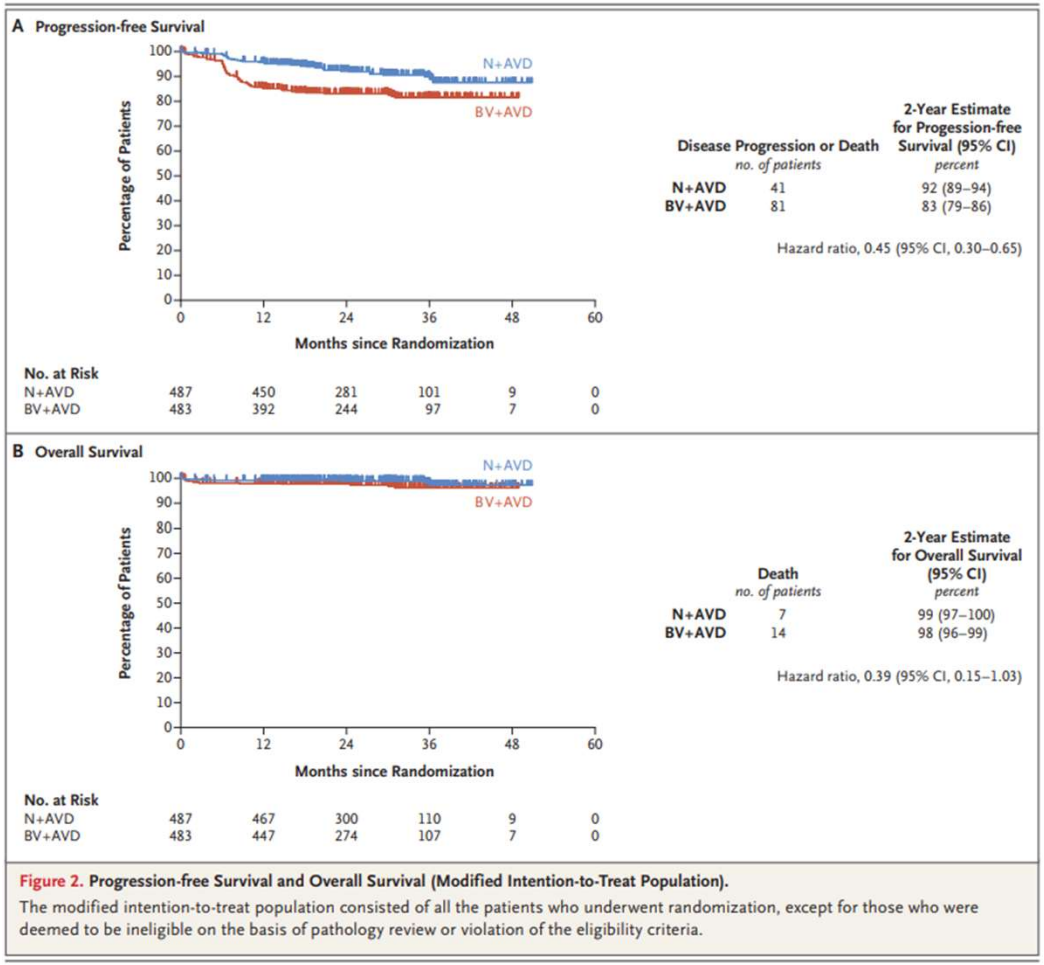
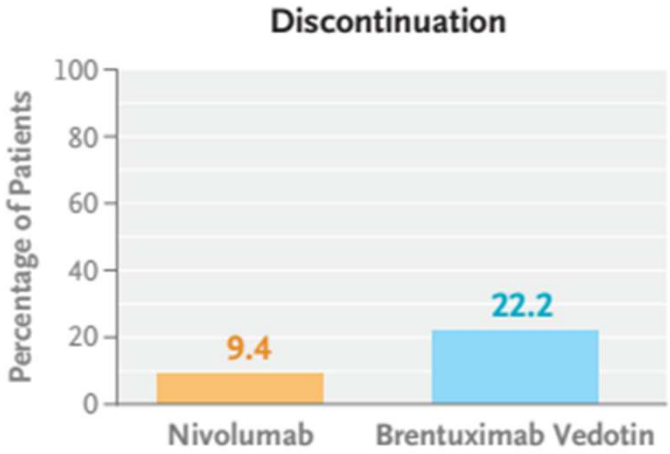


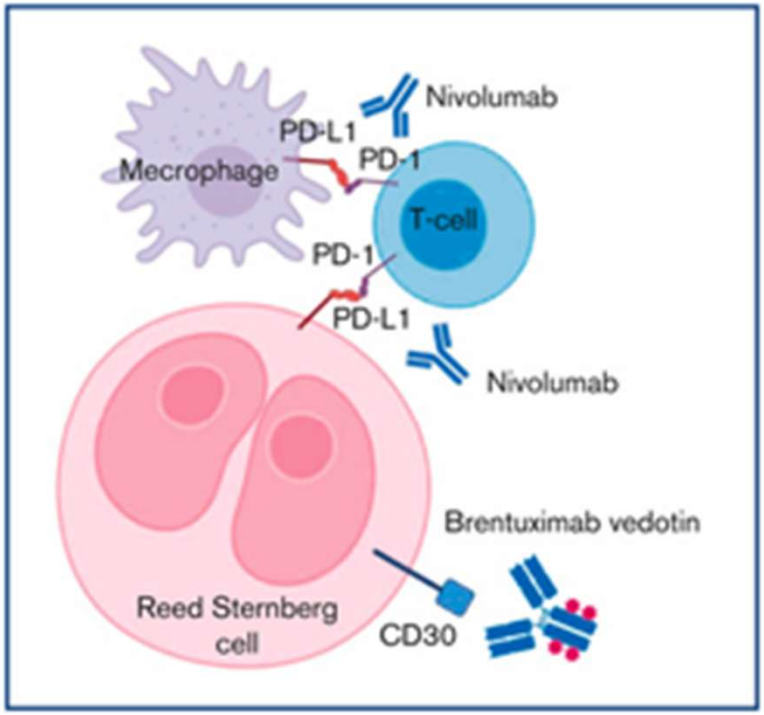
Figure 2. Progression-free Survival and Overall Survival (Modified Intention-to-Treat Population).
The modified intention-to-treat population consisted of all the patients who underwent randomization, except for those who were deemed to be ineligible on the basis of pathology review or violation of the eligibility criteria.



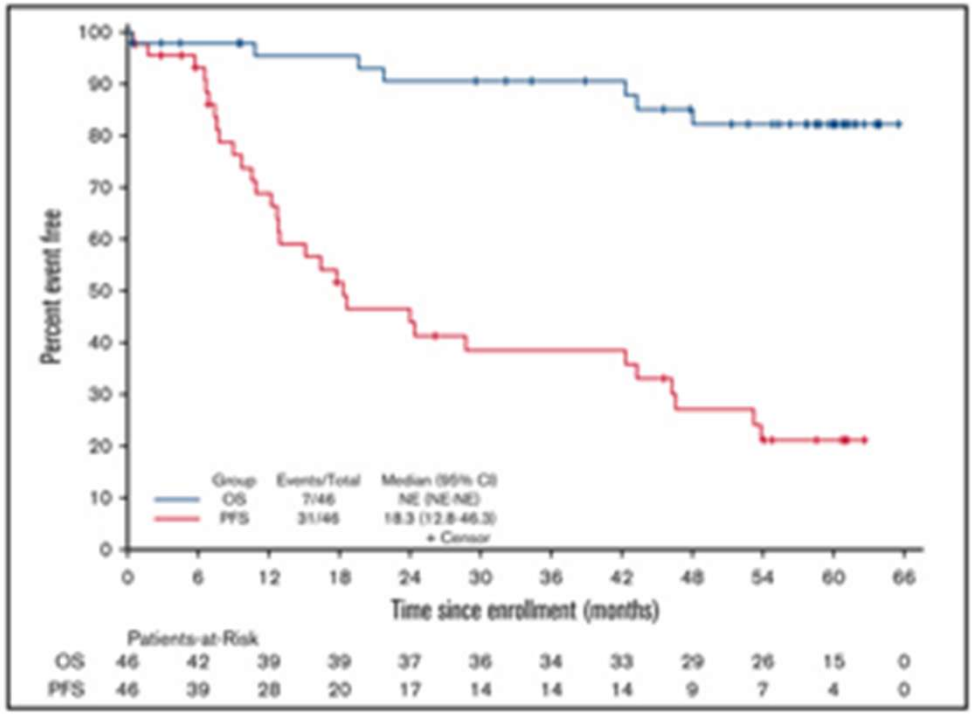
Herrera AF, et al. N Engl J Med 2024;391:1379-89

Immuuntherapie: Nivolumab en BV

A. Mechanism of Action of BV-Nivo



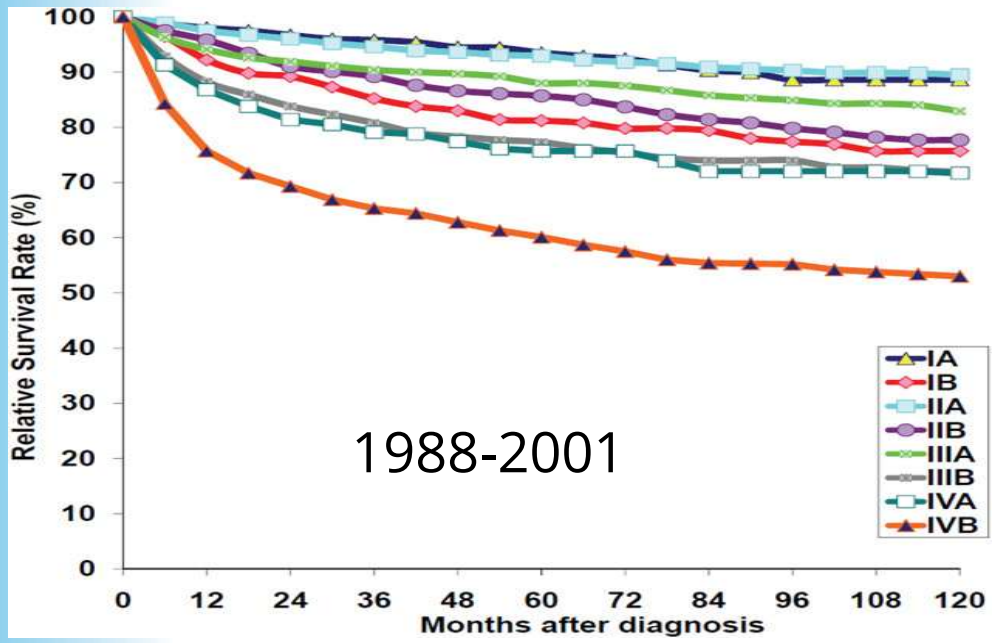
B. Results

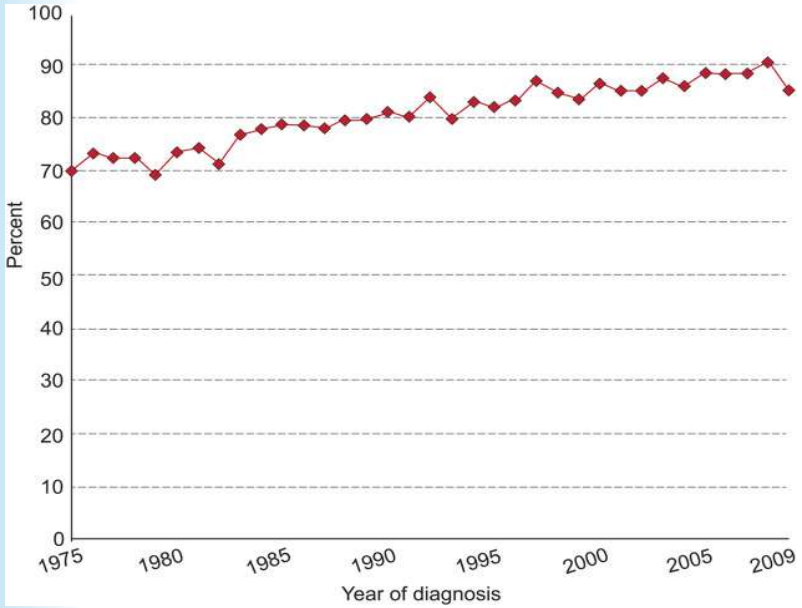


> 60 jaar

Cheson BD, et al. Blood Adv 2025;9:3750-3

Prognose





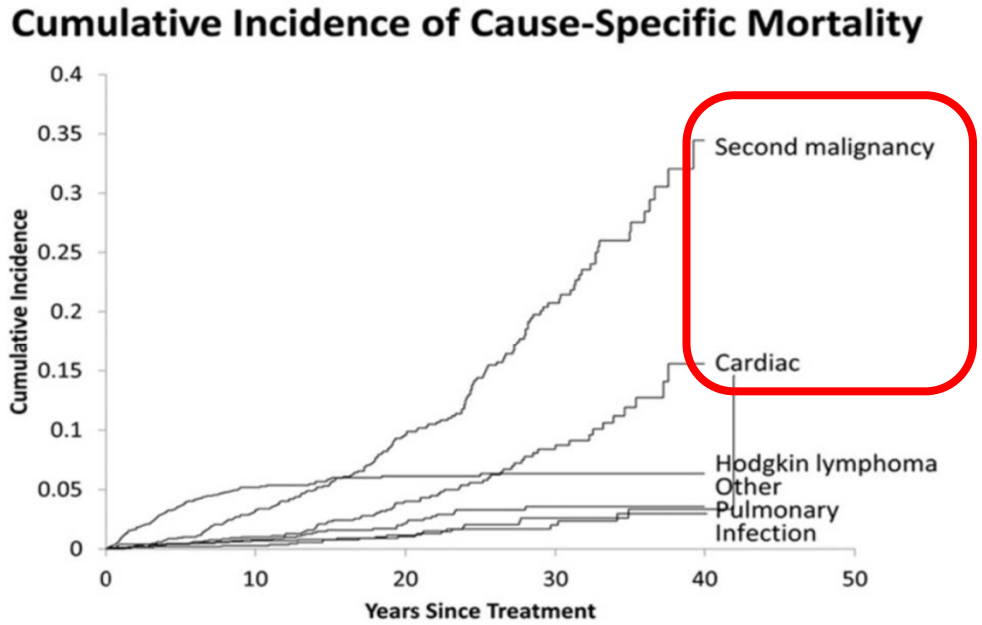
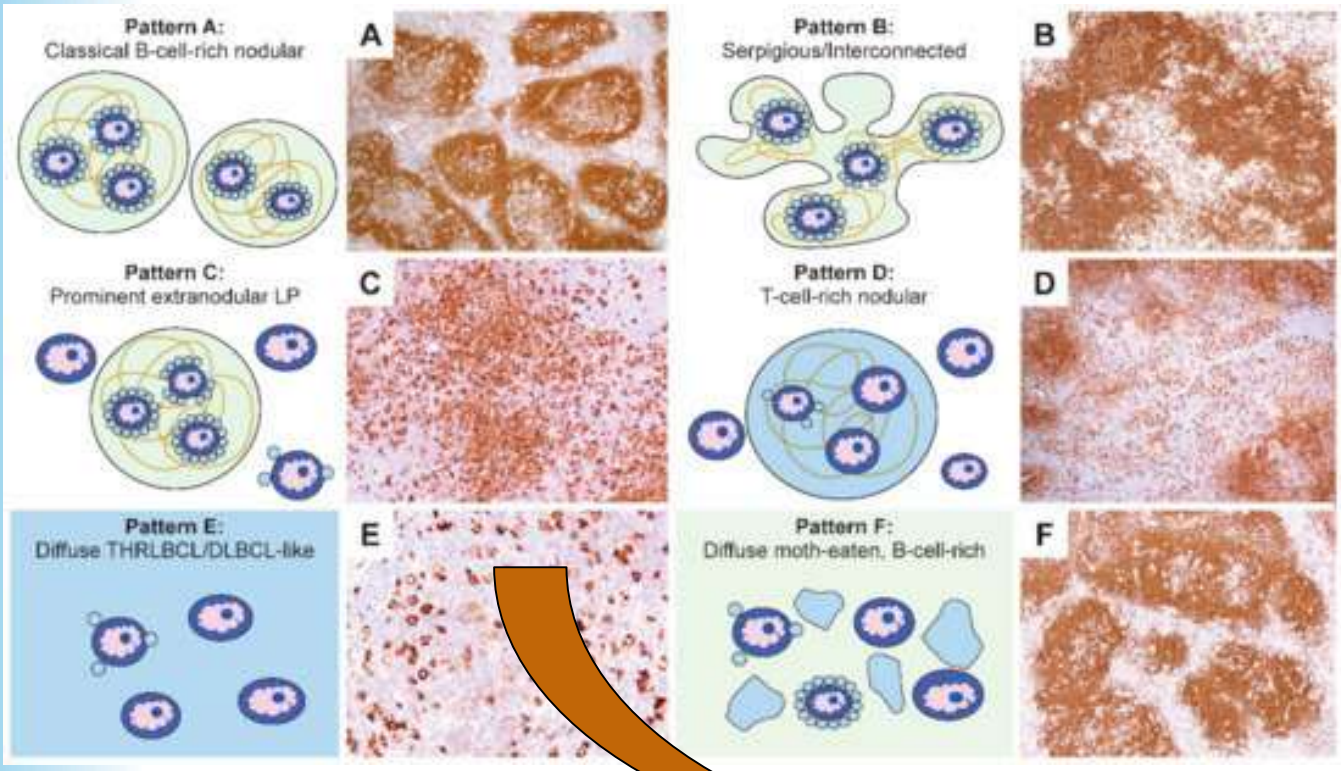


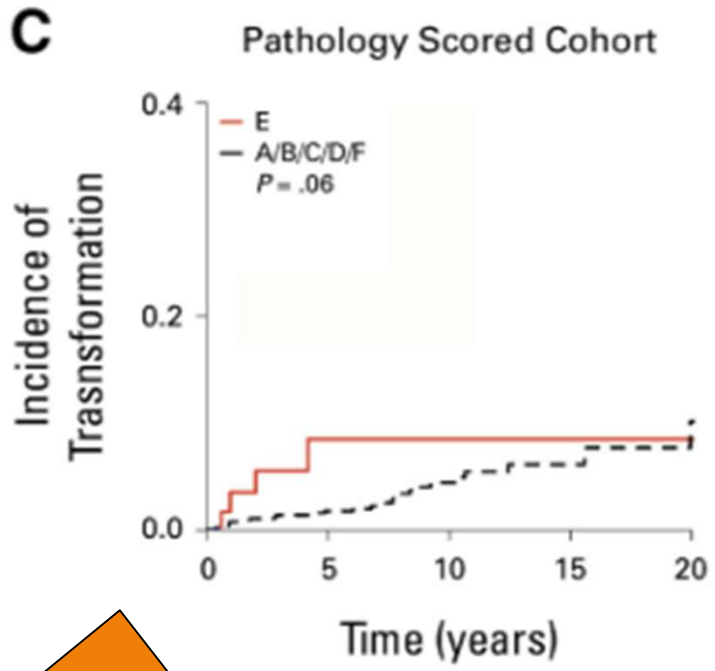
Figure 1. Cumulative incidence of cause-specific mortality of long-term HL survivors.

Shanbhag S, Ambinder RF. CA Cancer J Clin 2018;68:116-32

Nodulair lymfocytair predominant Hodgkin lymfoom (NLPHL)

Fan patronen





NLPHL: nodulair predominant Hodgkin lymfoom
NLPBL: nodulair predominant B-cel lymfoom

Fan Z, et al. Am J Surg Pathol 2003;27:1346-56
Ypunes S, et al. Cancers 2021;13:3021
Binkley MS, et al. J Clin Oncol 2024;42:2771-80

Nodulair lymfocytair predominant Hodgkin lymfoom (NLPHL)

Stage	Treatment	PFS	OS	Reference
	RT alone			
Stage IA	RT alone	8-year PFS: 84.3% (EF-RT) 91.9% (IF-RT)	8-year OS: 95.7% (EF-RT) 99% (IF-RT)	[16]
Stage I	RT alone	10-year PFS: 89%	10-year OS: 96%	[18]
Stage II	RT alone	10-year PFS: 72%	10-year OS: 100%	[18]
Stages I/II	RT alone	5-year PFS: 91.1%	5-year PFS: 99.4%	[24]
Limited-stage	RT alone	10-year PFS: 65%	10-year OS: 84%	[25]
	HL-directed approaches			
Limited-stage	ABVD(-like) chemotherapy plus RT	10-year PFS: 91%	10-year OS: 93%	[25]
Stage I/II	Combined-modality treatment	5-year PFS: 90.5%	5-year PFS: 99.4%	[24]
Early stage favorable	ABVD(-like) chemotherapy plus RT	10-year PFS: 79.7%	10-year OS: 93.3%	[26]
Early stage unfavorable	ABVD(-like) or BEACOPP variants plus RT	10-year PFS: 72.1%	10-year OS: 96.2%	[26]
Stages II–IV	ABVD ± RT	5-year PFS: 72.7%	5-year OS: 95.0%	[27]
Advanced	ABVD(-like) ± RT	10-year TTP: 63%	10-year OS: 83.5%	[28]
Advanced	BEACOPP variants ± RT	10-year PFS: 69.8%	10-year OS: 87.4%	[26]
	Rituximab-containing and NHL-directed approaches			
Stage IA	Rituximab alone	10-year PFS: 51.1%	10-year OS: 91%	[29]
All stages	Rituximab alone	5-year PFS: 41.7%	5-year OS: 100%	[30]
All stages	Rituximab induction plus rituximab maintenance	5-year PFS: 51.9%	5-year OS: 100%	[30]
Stages II–IV	Rituximab plus chemotherapy (ABVD or CHOP)	5-year PFS: 89.6%	5-year OS: 98.8%	[27]
All stages	Rituximab plus bendamustine	After 74 months median FU (20 pts): no relapse	After 74 months median FU (20 pts): no death	[31]

Observatie

Radiotherapie

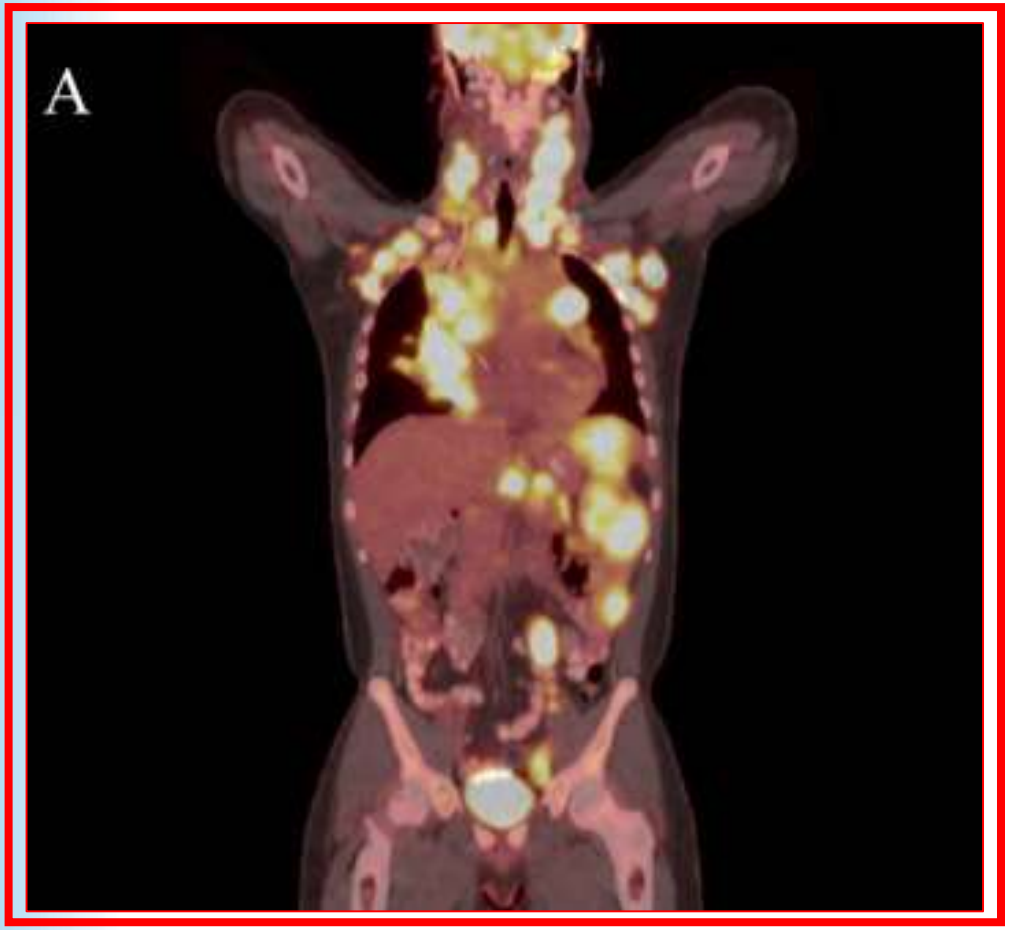
Klassiek HL therapie

Rituximab bevattend schema (CD20)

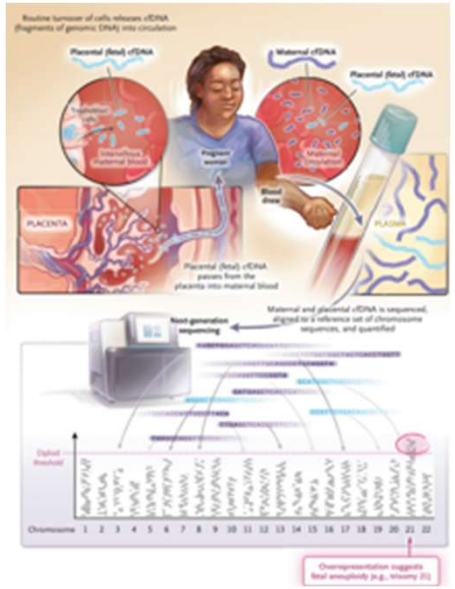
Eichenauer DA, Fuchs MV. Cancers (Basel) 2023:15:3310

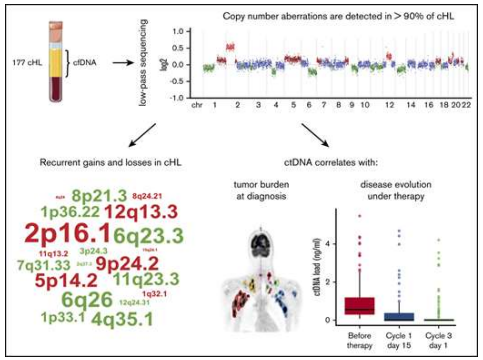
Hodgkin lymfoom tijdens zwangerschap

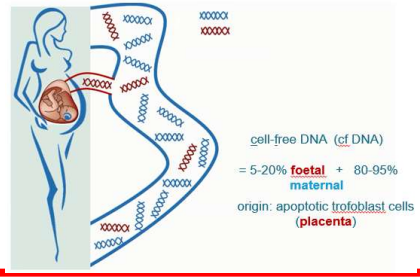
“Klassieke” tekens en symptomen



Non-invasive prenatal testing (NIPT)







Vandenberghe P, et al. Lancet Haematol 2015;2:e55-65
Shanbhaq S, Ambinder RF. CA Cancer J Clin 2018;68:116-3
Buedts L, et al. Blood Adv 2021;5:1991-2002
Norton ME. N Engl J Med 2022;387:1322-4
Manescu P, et al. Sci Rep 2023;13:2562

Staging tijdens zwangerschap

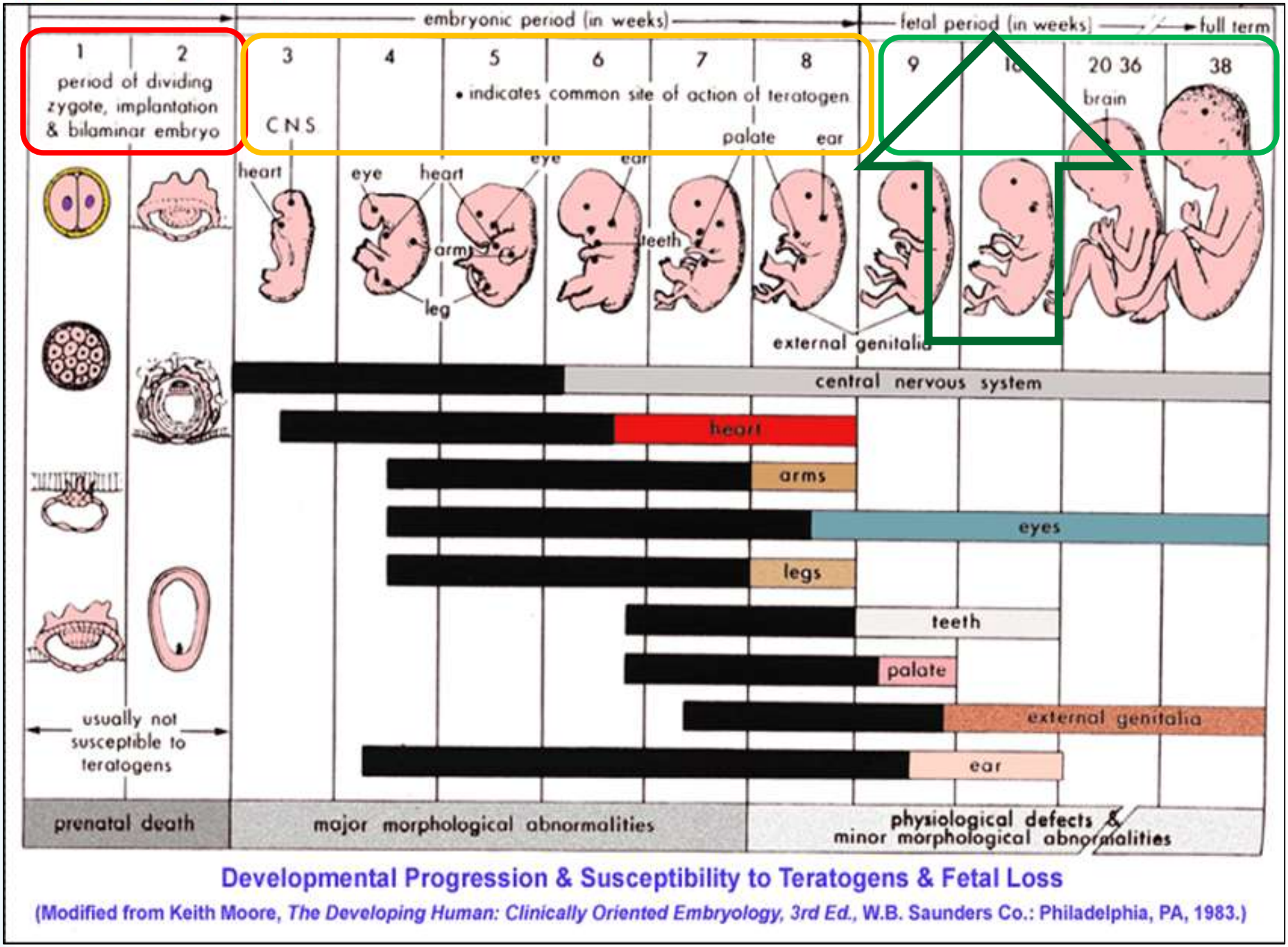
	ESUR (2018)	ACR (2018)	ACOG (2017)
IODINATED CONTRAST AGENTS (ICA)		PET/CT scan	
GADOLINIUM-BASED CONTRAST AGENTS (GBCA)		MRI scan	

ICA – iodinated contra

European Society of Urogenital Radiology; ACR - American College of Radiology; ACOG - American College of Obstetricians and Gynecologists

European Society of Urogenital Radiology Guidelines on Contrast Media version 10.0. American College of Radiology. Manual on Contrast Media, version 10.3. American College of Obstetricians and Gynecologists' Committee on Obstetric Practice. Committee Opinion No. 723: guidelines for diagnostic imaging during pregnancy and lactation. Obstet Gynecol 2017;130:e210-6

Wanneer behandeling starten?

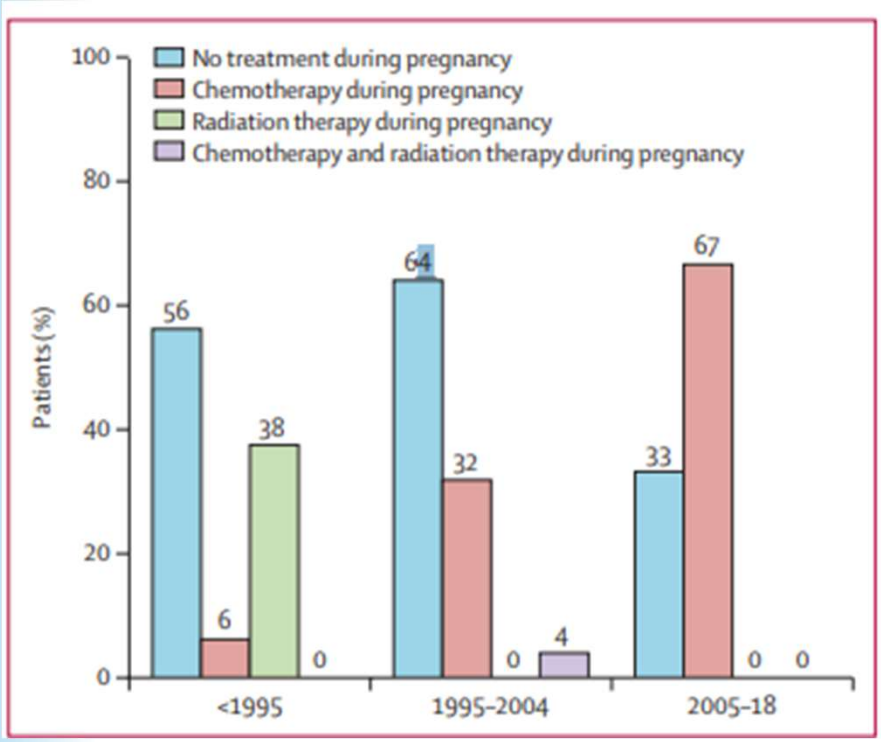


Developmental Progression & Susceptibility to Teratogens & Fetal Loss

(Modified from Keith Moore, *The Developing Human: Clinically Oriented Embryology, 3rd Ed.*, W.B. Saunders Co.: Philadelphia, PA, 1983.)

Hodgkin lymfoom tijdens zwangerschap

Multicenter retrospectieve analyse
1969-2018



Maternale uitkomst idem als bij niet-zwangeren

Iets meer verloskundige complicaties (vroegtijdige contracties, vroegtijdig breken vliezen)

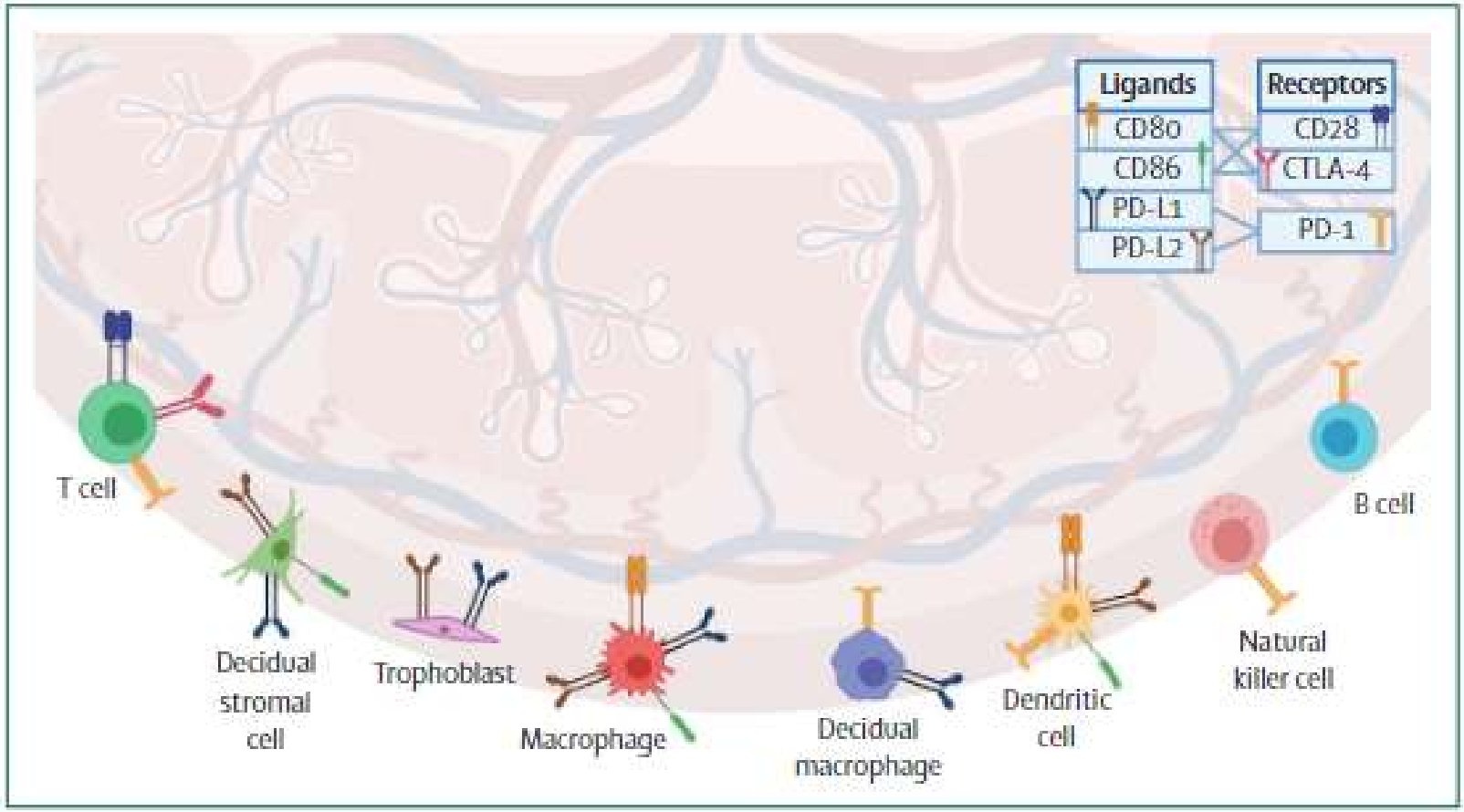
Normale psychologische en fysieke ontwikkeling kind

Maggen C, et al. Lancet Haematol 2019;6:e551-61

Behandeling Hodgkin lymfoom tijdens zwangerschap

- Meeste gevallen: beperkt stadium
- Zelden nood aan dringende behandeling
- 1ste trimester: vermijden van behandeling
- > 1ste trimester: ABVD (doxorubicine-bleomycine-vinblastine-dacarbazine)
- Radiotherapie: zo mogelijk uitstel tot na bevalling
- Brentuximab vedotin: absoluut verboden
- Checkpoint inhibitors: voorzichtig

Behandeling Hodgkin lymfoom tijdens zwangerschap

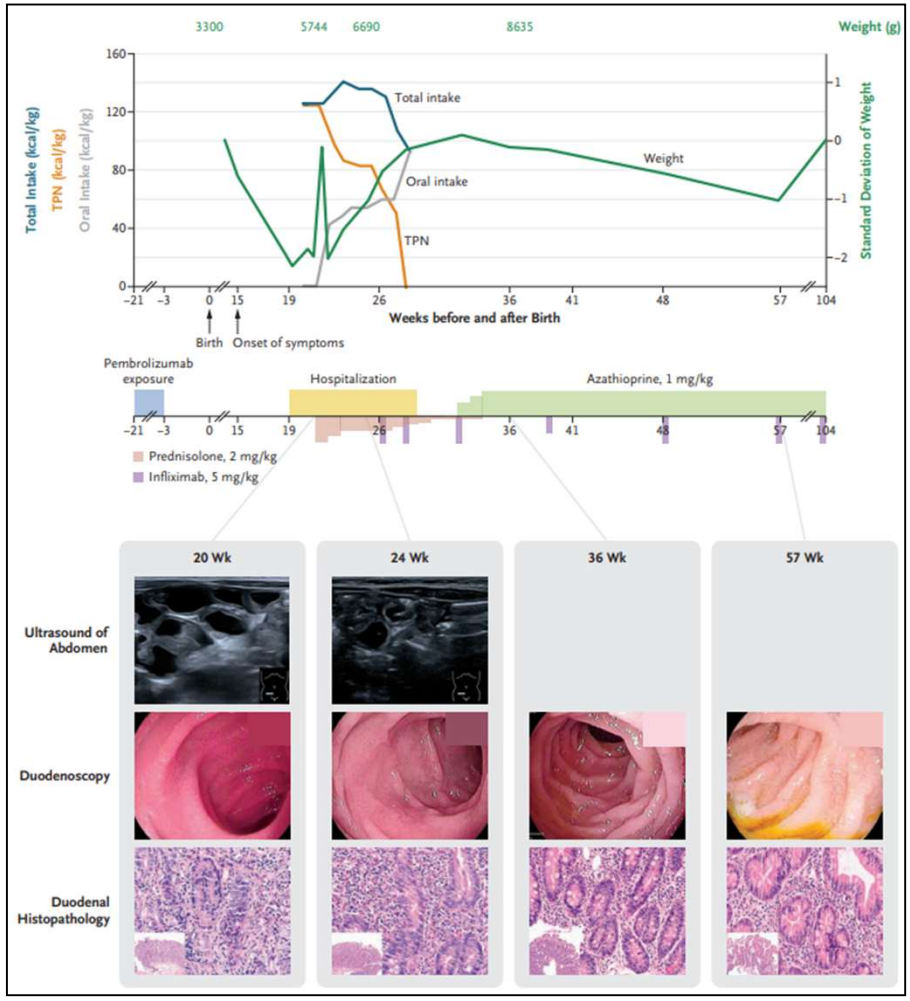


Cruciale rol in fetomaternale ontwikkeling

Borgers J, et al. Lancet Oncol 2021;22:e650-61
Joo JS, et al. Immune Netw 2024;24:e30

Behandeling Hodgkin lymfoom tijdens zwangerschap

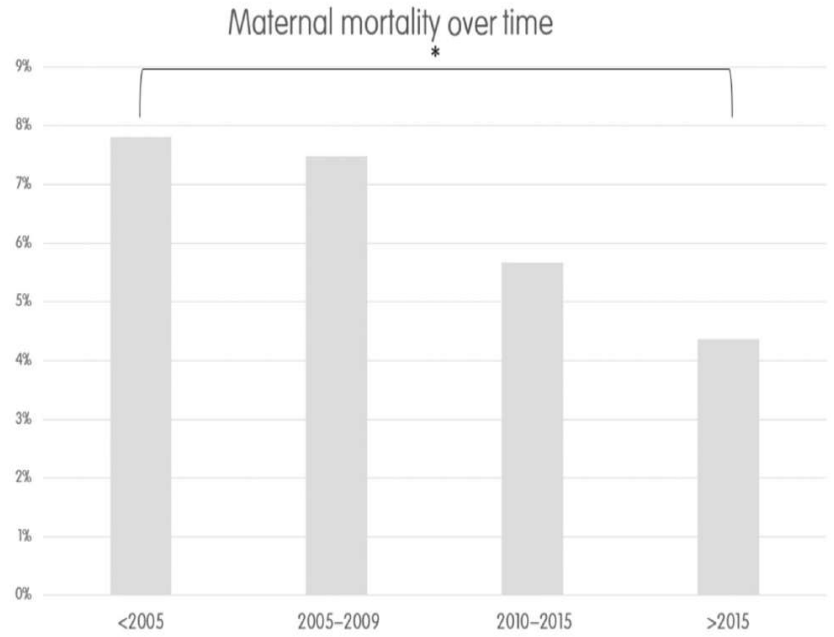
Checkpoint inhibitors tijdens zwangerschap: opletten voor nevenwerkingen bij kind na geboorte!



Baarslag MA, et al. N Engl J Med 2023;389:1790-6

Risico op overlijden moeder

n= 2359
131 overleden
tijdens zwangerschap (n=10)
binnen jaar na bevalling (n=121)



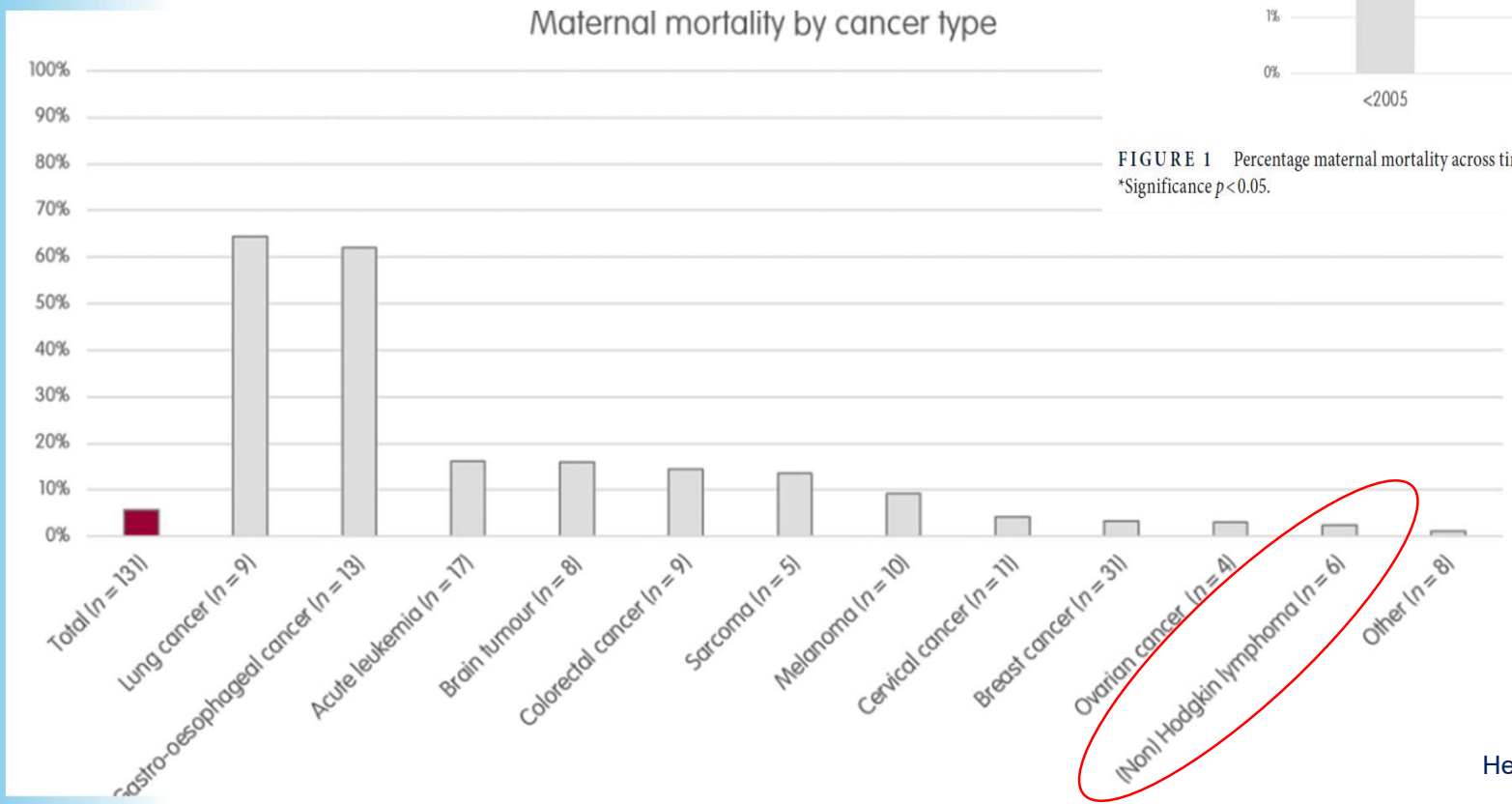


FIGURE 1 Percentage maternal mortality across time in the International Network on Cancer, Infertility and Pregnancy (INCIP) cohort. *Significance $p < 0.05$.

Heimovaara JH, et al. BJOG 2024;131:1694-704