Aging in the Context of HIV and Cancer: What Does "Age" Actually Mean, and Can It Impact Cancer Survivorship?



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IAS–USA

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Financial Relationships With Ineligible Companies (Formerly Described as Commercial Interests by the ACCME) Within the Last 2 Years

Dr Coghill reported no relevant financial relationships with ineligible companies. (Updated November 10, 2025)

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Learning Objectives

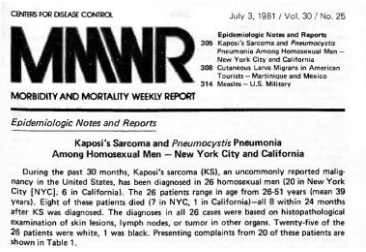
After attending this presentation, learners will be able to:

- Describe how improved survival with effective HIV therapy, and thereby aging, is influencing the cancer burden among people with HIV (PWH) in the US
- Understand what is meant by the phrase "PWH may be more aged than individuals without HIV," and why this may drive mortality after a cancer diagnosis
- List gaps in cancer care for PWH, including lack of HIV testing at oncology centers and lower rates of cancer treatment
- Apply cancer treatment and screening guidelines specific to PWH

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Cancer has been linked to HIV since the beginning of the epidemic in the United States.



CENTERS FOR DISEASE CONTROL

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MMWR

MORBIDITY AND MORTALITY WEEKLY REPORT

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Epidemiologic Notes and Reports

Kaposi's Sarcoma and *Pneumocystis* Pneumonia Among Homosexual Men — New York City and California

During the past 30 months, Kaposi's sarcoma (KS), an uncommonly reported malignancy in the United States, has been diagnosed in 26 homosexual men (20 in New York City [NYC], 6 in California). The 26 patients range in age from 26-51 years (mean 39 years). Eight of these patients died (7 in NYC, 1 in California)—all 8 within 24 months after KS was diagnosed. The diagnoses in all 26 cases were based on histopathological examination of skin lesions, lymph nodes, or tumor in other organs. Twenty-five of the 26 patients were white, 1 was black. Presenting complaints from 20 of these patients are shown in Table 1.

Slide 4

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People with HIV (PWH) still have an elevated risk for many infection-related cancers.

Standardized Incidence Ratios (SIRs) for PWH (1996-2012), compared to the general population.

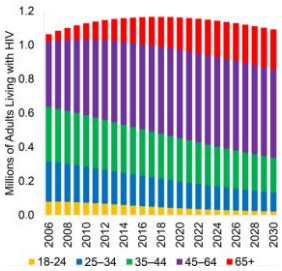
Cancer Types	Observed Cases	SIR (95% CI)*
All cancers	21,294	1.69 (1.67-1.72)
AIDS-defining cancers	6,384	14.0 (13.6-14.3)
Kaposi sarcoma	2,269	498 (478-519)
AIDS-defining NHLs	3,687	11.5 (11.1-11.9)
DLBCL	2,242	10.3 (9.89-10.7)
Burkitt lymphoma	435	20.2 (18.4-22.2)
Unspecified NHL	1,010	12.4 (11.7-13.2)
CNS NHL	528	153 (140-167)
Cervical cancer	**428**	**3.24 (2.94-3.56)**
Non-AIDS cancers (NADCs)	14,344	1.21 (1.19-1.23)
Viral NADCs	4,144	5.39 (5.23-5.55)
HPV-related oral cavity pharynx	297	1.64 (1.46-1.84)
Anus	**1,568**	**19.1 (18.1-20.0)**
Liver	**1,104**	**3.21 (3.02-3.41)**
Merkel cell carcinoma	10	2.58 (1.24-4.74)
Vagina	25	3.55 (2.36-5.24)
Vulva	151	9.35 (7.91-11.0)
Penis	114	5.33 (4.39-6.40)
Hodgkin lymphoma	875	7.70 (7.20-8.23)

Hernandez-Ramirez Lancet HIV 2018

Slide 5

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Increased life expectancy has impacted the cancer burden, to a broader set of age-related solid organ tumors.



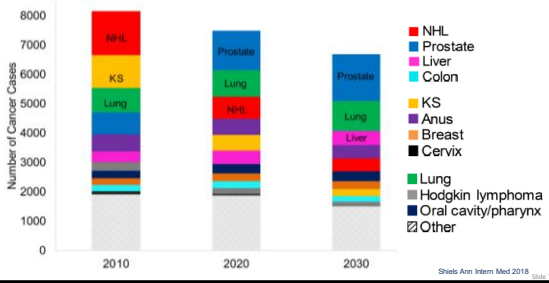
- HIV infection *is not associated with an increased risk* of every cancer type.
- **However**, if more PWH survive to >60 years of age, then the *number of PWH at risk* of cancer increases.

Shiels Ann Intern Med 2018

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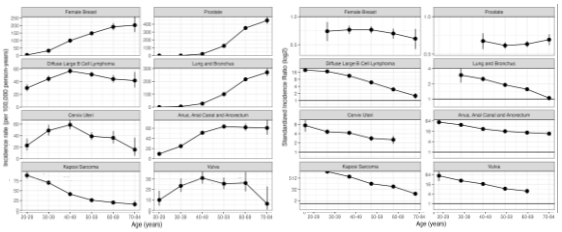
Increased life expectancy has impacted the cancer burden, to a broader set of age-related solid organ tumors.



Shiels Ann Intern Med 2018 Slide 7

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HIV and AIDS Cancer Match (HACM) data (2010-2019) on age-specific cancer incidence and relative rates (SIRs): *Dr. Cameron Hass (NCI) presentation at 2024 International Conference on Malignancies in HIV*



At what ages will we see the most cancers in PWH? *At what ages is this more than what is expected?*

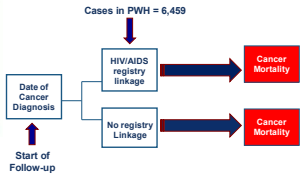
Slide 8

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Examining cancer mortality in PWH: HIV/AIDS Cancer Match Study



States	Years
Colorado	1996-2007
Connecticut	2002-2010
Georgia	2004-2008
New Jersey	1996-2007
Texas	1997-2009
Michigan	1996-2010

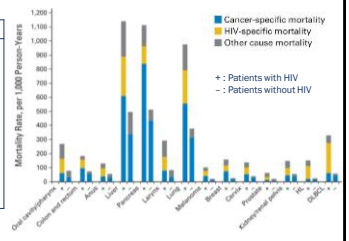


https://dceg.cancer.gov/research/who-we-study/cohorts/hiv-aids-cancer-match-study Slide 9

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PWH experience higher, stage-adjusted cancer-specific mortality.

Diagnosis	Cancer Deaths in HIV/AIDS	Hazard Ratio	95% CI
Oropharynx	38	1.31	0.94-1.83
Colorectal	86	**1.49**	**1.21-1.84**
Breast	68	**2.61**	**2.06-3.31**
Liver	137	1.17	0.99-1.39
Pancreas	67	**1.71**	**1.35-2.18**
Larynx	22	**1.62**	**1.06-2.47**
Lung	517	**1.28**	**1.17-1.39**
Melanoma	19	**1.72**	**1.09-2.70**
Prostate	21	**1.57**	**1.02-2.41**



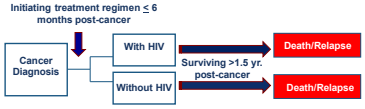
Coghill JCO 2015 Slide 10

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In PWH 65+ years, HIV remained associated with poor clinical outcomes in patients with age-related cancers.

	Colorectal Cancer	NSCLC	Prostate Cancer	Breast Cancer
Relapse or death				
Cancer patients with HIV	29	26	138	44
Outcomes (% patients)	16 (55.2%)	19 (73.1%)	60 (43.5%)	24 (54.6%)
Cancer patients without HIV	43,167	21,932	104,465	88,591
Outcomes (% patients)	25,512 (59.1%)	15,487 (70.6%)	43,205 (41.4%)	41,639 (47.0%)
Adjusted HR (95%CI)	**1.58 (0.97-2.58)**	1.23 (0.79-1.93)	**1.32 (1.03-1.71)**	**1.63 (1.09-2.43)**
	P=0.07	*P*=0.36	*P*=0.03	*P*=0.02

Adjusted for time to treatment, treatment type (prostate: surgery, RT, or hormonal), 5-FU cycles (regional colorectal), platinum-based chemotherapy (regional NSCLC), and receipt of radiation or cyclophosphamide (breast cancer)



Coghill JAMA Oncology 2019 Slide 11

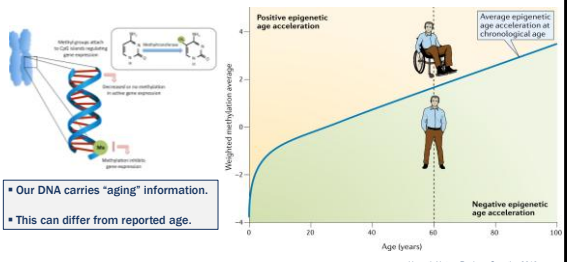
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What influences clinical outcomes in cancer patients with HIV?

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Epigenetic (DNA methylation) patterns can be translated into 'aging clocks' – how old is your DNA?



- Our DNA carries "aging" information.
- This can differ from reported age.

Horvath Nature Reviews Genetics 2018

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Table 1. Characteristics of the Moffitt cancer patients

	PWoH (n=64) N (%)	PWH (n=65) N (%)
Age at Cancer Diagnosis		
<50	16 (25.0)	14 (21.5)
>50	48 (75.0)	51 (78.5)
Vital Status		
Alive	56 (87.5)	41 (63.1)
Deceased	8 (12.5)	24 (36.9)
Race		
Black	2 (3.1)	18 (27.7)
White	58 (90.6)	42 (64.6)
Other	4 (6.3)	5 (7.7)
Sex		
Female	31 (48.4)	15 (23.1)
Male	33 (51.6)	50 (76.9)
Primary Site		
Breast	2 (3.1)	3 (4.6)
GI	31 (48.4)	33 (50.8)
GU	14 (21.9)	12 (18.5)
GYN	2 (3.1)	2 (3.1)
Head and Neck	4 (6.3)	4 (6.2)
Lung	8 (12.5)	8 (12.3)
Skin	3 (4.7)	3 (4.6)
Tumor Sequence		
0-1	48 (75.0)	50 (76.9)
2	16 (25.0)	15 (23.1)

Inclusion Criteria:
- Patients diagnosed with a solid tumor
- Diagnosis occurred between 2004-2021
- Blood collected within 1 year of treatment

Patients without HIV matched:
- Reported age within 5 years
- Cancer site
- Tumor sequence
- Treatment-to-specimen lag



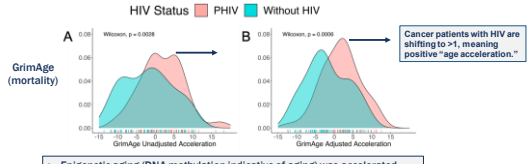
EstimAge
http://estimage.iac.rm.cnr.it

Dickey, et.al., Coghill AIDS 2023

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Accelerated DNA aging exists in PWH with cancer. This could impact mortality after a cancer diagnosis.



Cancer patients with HIV are shifting to >1, meaning positive "age acceleration."

- Epigenetic aging (DNA methylation indicative of aging) was accelerated.
- Each unit of GrimAge acceleration, was associated with an 11% increase in mortality among PWH. (HR=1.11; 95% CI 1.04-1.18)
- This elevation in mortality risk was independent of immune cell counts.

Dickey, et.al., Coghill AIDS 2023

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Inequities in appropriate cancer treatment exist for PWH.

TABLE 2. Comparison of PC Receipt Between HIV-Positive and HIV-Negative Cancer Patients by Stage at Diagnosis, NCDB (2004-2018)

Characteristic	Palliative, No. (%) No	Yes	Crude ORs (95% CI)	aORs (95% CI)
HIV-negative	18,358,517 (96.0)	757,003 (4.0)		
HIV-positive	49,745 (95.1)	2,561 (4.9)	1.24 (1.20 to 1.29)	1.25 (1.20 to 1.30)
Stage I-III				
HIV-negative	10,923,256 (98.8)	128,819 (1.2)		
HIV-positive	23,516 (97.7)	543 (2.3)	1.95 (1.79 to 2.13)	1.96 (1.80 to 2.13)
Stage IV				
HIV-negative	2,494,710 (83.6)	490,238 (16.4)		
HIV-positive	10,799 (88.1)	1,455 (11.9)	0.68 (0.65 to 0.72)	0.70 (0.66 to 0.74)

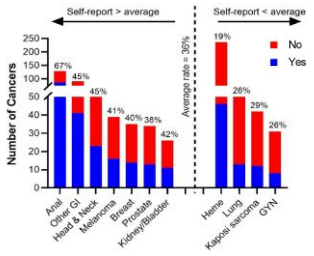
- PWH diagnosed with Stage I-III cancers were more likely to receive palliative cancer treatment, not curative cancer treatment. *Curative treatment is recommended for Stage I-III disease.*
- PWH diagnosed with Stage IV cancers were less likely to receive palliative cancer treatment. *Palliative treatment is recommended for Stage IV disease.*

Islam JCO Oncology Practice 2022

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Identification of PWH presenting to Moffitt Cancer Center: attempt to use an electronic patient questionnaire



- In 10 years (2009-2019) of data, average self-disclosure of HIV was 36% (95% CI 33-39%).
- This varied by disease site (e.g., 67% for anal SCC).
- This also varied by gender and race/ethnicity, highlighting key limitations for identifying PWH.

Coghill JNCI Cancer Spectrum 2021

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Cancer screening and treatment guidelines among PWH

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National Comprehensive Cancer Network (NCCN) Guidelines

A set of guidelines specific to PWH with cancer was published in 2018 (Drs. Gita Suneja and Erin Reid co-chaired the committee). Key principles include:

- **Treat cancer like you would in a patient without HIV:** Cancer treatment should not be modified solely based on HIV status. The goal is to provide the most appropriate cancer care.
- **Co-manage care:** Patients should be managed jointly by an oncologist and an HIV specialist.
- **Review potential interactions:** Oncologists and HIV specialists must work with pharmacists to review proposed cancer therapy and ART for potential drug-drug interactions and overlapping toxicities before starting treatment.
- **Continue HIV therapy:** HIV therapy should be continued during cancer treatment, though modifications may be needed.

Specific cancer guidelines: ***AIDS-related Kaposi Sarcoma*** has a separate set of specific NCCN guidelines, and the NCCN guidelines for B-cell lymphomas includes a separate section for ***AIDS-related B-cell lymphomas***.

Reid JNCCN 2018

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Cancer Screening Guidelines (USPSTF)

People with HIV have specific cancer screening guidelines that focus on increased risk for certain cancers, including anal and cervical cancers. Standard, age-appropriate screening for other cancers like breast, colorectal, and lung cancer should be followed.

Cancer	Screening Frequency	Age Range
Breast (B)	Biennial screening mammography	Women, aged 40 to 74 years
Colorectal (A)	Recommended screening strategies include: • High-sensitivity guaiac fecal occult blood test (HSgFOBT) or fecal immunochemical test (FIT) every year • Stool DNA-FIT every 1 to 3 years • Computed tomography colonography every 5 years • Flexible sigmoidoscopy every 5 years • Flexible sigmoidoscopy every 10 years + annual FIT • Colonoscopy screening every 10 years	Adults, aged 50* to 75 years
Lung (B)	Annual screening with low-dose computed tomography (LDCT)	Adults, aged 50 to 80 years with 20 pack-year smoking history and either a current smoker or quit within the past 15 years

https://www.uspreventiveservicestaskforce.org/uspstf/

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Cancer Screening Guidelines (IDSA)

Cervical cancer

- **Immediately after an HIV diagnosis:** USPSTF recommends that women with HIV should have a Pap smear at the time of initial HIV diagnosis.
- **Women aged 21–29:** Annual cervical Pap tests. If three consecutive tests are normal, screening can be done every three years.
- **Women aged 30 and older:**
  - Annual cervical Pap tests. If three consecutive tests are normal, screening can be done every three years.
  - If annal cervical Pap tests are performed with hr-HPV co-testing, then screening can be done every three years after a single normal test.
- **Follow-up actions:**
  - Abnormal Pap test results require follow-up colposcopy or repeat Pap in 6-12 months.
  - Colposcopy is recommended if hr-HPV co-testing reveals HPV16 or HPV18.
- **Screening duration:** No age limit for screening exists if the immune system remains compromised.

Section 5: https://www.idsociety.org/practice-guideline/primary-care-management-of-people-with-hiv/

USPSTF: Cervical Cancer screening **in persons without HIV**	• Every 3 years with cervical cytology alone in women aged 21 to 29 years
	• For women aged 30 to 65 years:
	  ▪ Every 3 years with cervical cytology alone
	  ▪ Every 5 years with high-risk human papillomavirus (hrHPV) testing alone or in combination with cytology (cotesting)

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Cancer Screening Guidelines (IDSA)

Anal cancer

- **Screening:** Annual screening is recommended starting at age 35 for men who have sex with men and transgender women, and at age 45 for all PWH. (No ending age is given.)
- **Methods:**
  - A digital anorectal exam (DARE) should be done annually even if high-resolution anoscopy (HRA) is not available.
  - Anal pap tests should be performed annually if there is access to HRA and treatment.
    - High-risk HPV (hr-HPV) co-testing is recommended to occur as co-testing with anal paps rather than as a solo test.
- **Treatment:**
  - If a low-grade squamous intraepithelial lesion (LSIL) is identified, refer for HRA and hr-HPV testing.
  - If a high-grade squamous intraepithelial lesion (HSIL) is identified, treatment should be performed, followed by routine monitoring to reduce the risk of developing anal cancer.

ANCHOR trial: Palefsky NEJM 2022

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Summary

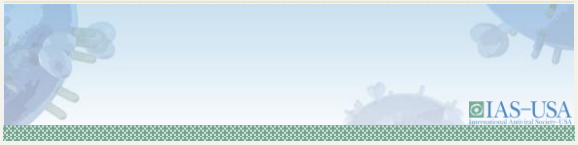
- The aging of the US HIV population has markedly changed the cancer burden among PWH.
- As cancer continues to become increasingly prevalent, it is important to estimate age-specific measures of cancer association and burden.
- PWH experience higher mortality rates after their cancer diagnosis, and this might be driven in part by biological changes present in PWH with a cancer diagnosis (e.g., DNA aging).
- Studies have demonstrated that PWH do not consistently receive recommended cancer treatment, and HIV status is not always readily available in the cancer treatment setting.

- Treat cancer like you would in a patient without HIV. The goal is to provide appropriate cancer care.
- People with HIV have specific cancer screening guidelines for anal and cervical cancers. Standard, age-appropriate screening for other cancers (breast, colorectal, lung) should be followed.

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Q and A Session



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