



Findings from the Women's Interagency HIV Study

Lay Language Summaries for the Community

Chicago-Cook County
2012-2023

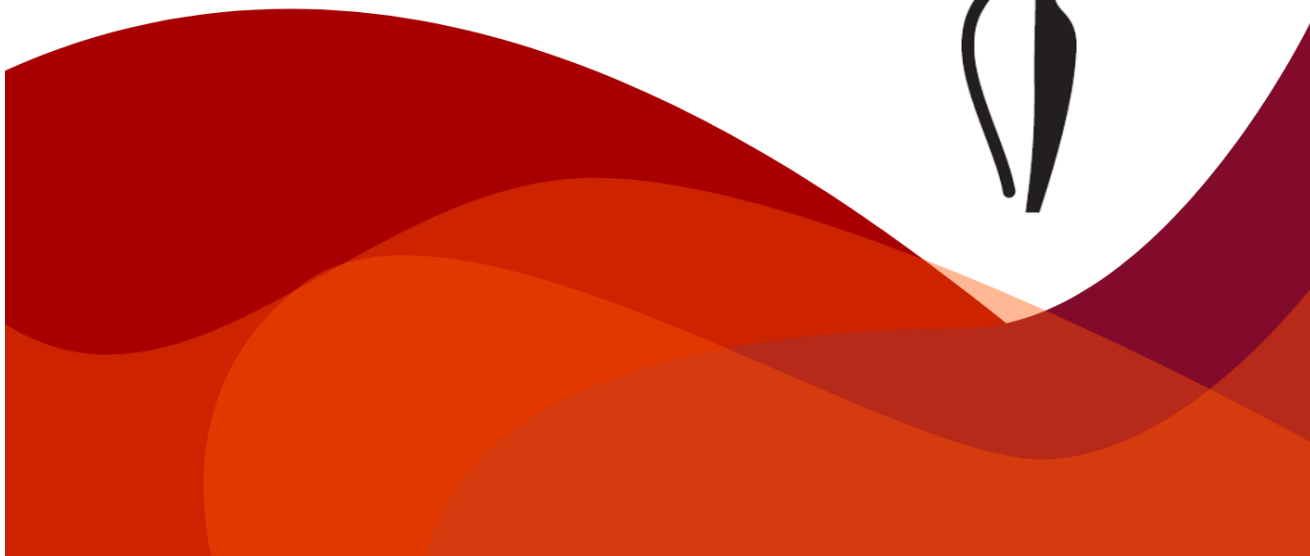


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Bone Health

Brief Report: Undercarboxylated Osteocalcin Is Associated With Cognition in Women With and Without HIV

Bone loss and cognitive impairment are common in women living with HIV and are exacerbated by menopause. The study aimed to investigate the link between 2 proteins (undercarboxylated osteocalcin and sclerostin) and cognition in midlife women with and without HIV. Researchers found that neither of these proteins predicted changes in neuropsychological performance over time in the overall group or in WLWH. ucOCN was positively linked with executive function in the overall group and in WLWH. Also, ucOCN was associated with better motor skills in WLWH. However, there was a negative association between ucOCN and attention/working memory in all participants.

Ross RD, Olali AZ, Shi Q, Hoover DR, Sharma A, Weber KM, French AL, McKay H, Tien PC, Yin MT, Rubin LH. Brief Report: Undercarboxylated Osteocalcin Is Associated With Cognition in Women With and Without HIV. J Acquir Immune Defic Syndr. 2022 Oct 1;91(2):162-167. doi: 10.1097/QAI.0000000000003043. PMID: 36094482; PMCID: PMC9470989.

Bone Quality in Relation to HIV and Antiretroviral Drugs

People with HIV are more likely to develop osteoporosis, which causes bones to weaken and break more easily. The review aimed to look at what we currently know about the effects of HIV, HIV disease-related factors, and antiretroviral drugs (ARVs) on bone quality. Findings suggest that both HIV infection and ARVs negatively affect bone architecture. We need future studies to find out which factors, viral or ARVs, contribute to loss of bone quality and which bone quality factors are associated with fracture risk.

Olali AZ, Carpenter KA, Myers M, Sharma A, Yin MT, Al-Harathi L, Ross RD. Bone Quality in Relation to HIV and Antiretroviral Drugs. Curr HIV/AIDS Rep. 2022 Oct;19(5):312-327. doi: 10.1007/s11904-022-00613-1. Epub 2022 Jun 20. PMID: 35726043; PMCID: PMC10309294.

Change in Circulating Undercarboxylated Osteocalcin (ucOCN) Is Associated With Fat Accumulation in HIV-Seropositive Women

Bone loss and fat gain are both commonly reported in people with HIV. The current study looked at whether proteins produced by the bone are linked to fat gain in women with HIV.

We found that one particular bone produced protein was associated with fat gain and people that had the most protein produced had the least fat gained.

Olali AZ, Sharma A, Shi Q, Hoover DR, Weber KM, French AL, McKay HS, Tien PC, Al-Harathi L, Yin MT, Ross RD. Change in Circulating Undercarboxylated Osteocalcin (ucOCN) Is Associated With Fat Accumulation in HIV-Seropositive Women. J Acquir Immune Defic Syndr. 2021 Apr 15;86(5):e139-e145. doi: 10.1097/QAI.0000000000002617. PMID: 33399313; PMCID: PMC7933097.

Cervical Cancer and HPV

Frequency of high-grade squamous cervical lesions among women over age 65 years living with HIV

Pap testing can be lifesaving, as it can lead to prevention of otherwise fatal cervical cancers. However, Pap testing and the work-up to identify and treat cervical cancers that is required to achieve this cancer prevention benefit can be invasive and uncomfortable, even painful. This is especially true among older women. Women without HIV can stop cervical cancer screening at age 65 if they have never had cervical precancer and have 10 years of normal Pap testing. We set out to see if that's true of women living with HIV, who are more often infected with the human papillomavirus (HPV) that causes cervical cancer and who have more abnormal Pap tests and cervical cancers than women without HIV. We found that most women with HIV aren't eligible to stop screening--either because they've had precancers treated or because they have had some abnormality on Pap testing within the previous 10 years. However, among women who would be eligible to stop screening because they don't have either of these risk factors, the risk for precancerous changes in Pap was low and was not different from that among MWCCS/WIHS women without HIV. We concluded that women ages 65 years and up who are at low risk should discuss the risks and potential benefits of stopping screening with their clinicians.

Massad LS, Xie X, Minkoff HL, Michel KG, D'Souza G, Wang CC, Konkle-Parker D, Ofotokun I, Fischl MA, Rahangdale L, Strickler HD. Frequency of high-grade squamous cervical lesions among women over age 65 years living with HIV. Am J Obstet Gynecol. 2021 Oct;225(4):411.e1-411.e7. doi: 10.1016/j.ajog.2021.04.253. Epub 2021 May 3. PMID: 33957115; PMCID: PMC8492479.

Longitudinal assessment of abnormal Papanicolaou test rates among women with HIV

The study looked at longitudinal changes in the prevalence of abnormal Papanicolaou testing among women living with HIV. The unadjusted prevalence of any Pap abnormality was 679/1769 (38%) in the original cohort, 195/684 (29%) in the 2001-2002 cohort, 46/231 (20%) in the 2011-2012 cohort, and 71/449 (16%) in the 2013-2015 cohort. They found that rates of abnormal cytology among women with HIV have fallen during the past two decades.

Massad LS, Xie X, Minkoff H, Kassaye S, Karim R, Darragh TM, Golub ET, Adimora A, Wingood G, Fischl M, Konkle-Parker D, Strickler HD. Longitudinal assessment of abnormal Papanicolaou test rates among women with HIV. AIDS. 2020 Jan 1;34(1):73-80. doi: 10.1097/QAD.0000000000002388. PMID: 31789890; PMCID: PMC7138211.

Natural History of Cervical Intraepithelial Neoplasia-2 in HIV-Positive Women of Reproductive Age

The research looked at what happens over time with treated and untreated CIN2 in HIV-positive women. Among 104 HIV-positive women, 62 didn't get treatment for CIN2. Twelve of them (11.5%) saw CIN2 progress to CIN3, but none developed cervical cancer. There was no difference in how long it took for CIN2 to progress between those treated and untreated for CIN2. In HIV-positive women, every increase of 100 CD4 T cells was linked to a 33% lower chance of CIN2 progressing, even when considering treatment and HIV medication. CIN2 progression is rare in this group, whether or not they're treated. More research is needed to pinpoint factors that could help identify women most at risk of CIN2 progression.

Colie C, Michel KG, Massad LS, Wang C, D'Souza G, Rahangdale L, Flowers L, Milam J, Palefsky JM, Minkoff H, Strickler HD, Kassaye SG. Natural History of Cervical Intraepithelial Neoplasia-2 in HIV-Positive Women of Reproductive Age. J Acquir Immune Defic Syndr. 2018 Dec 15;79(5):573-579. doi: 10.1097/QAI.0000000000001865. PMID: 30272635; PMCID: PMC6231968.

Racial differences in human papilloma virus types amongst United States women with HIV and cervical precancer

In women with HIV, we found that African American women have a lower prevalence of HPV16 in cervical precancer compared to Caucasian women, regardless of their immune status. This suggests that racial differences exist in HPV prevalence among women with HIV. Future studies should investigate why these differences occur and whether similar patterns are seen in invasive cervical cancer. Additionally, nonavalent HPV vaccines may

be particularly beneficial for HIV-positive African American women, as they cover HPV types not included in other vaccines and may help prevent cervical precancer in this population.

Keller MJ, Burk RD, Massad LS, Eltoun IE, Hessol NA, Anastos K, Xie X, Minkoff H, Xue X, Reimers LL, Kuniholm M, D'Souza G, Colie C, Aouizerat B, Palefsky JM, Strickler HD. Racial differences in human papilloma virus types amongst United States women with HIV and cervical precancer. AIDS. 2018 Nov 28;32(18):2821-2826. doi: 10.1097/QAD.0000000000002005. PMID: 30234608; PMCID: PMC6499386.

Cervical cancer incidence after up to 20 years of observation among women with HIV

This study looked at the occurrence of invasive cervical cancer (ICC) over 21 years in women with and without HIV. They reviewed ICC cases in a group of HIV-positive and HIV-negative women who had regular Pap testing. After about 12 years of follow-up, they found four ICC cases in HIV-positive women, with only one in the last decade, and none in HIV-negative women. The rate of ICC didn't significantly differ between HIV-positive and negative women. The study suggests that while ICC is slightly more common in HIV-negative women, it's not a major concern for those with HIV who are in prevention programs as they age.

Massad LS, Hessol NA, Darragh TM, Minkoff H, Colie C, Wright RL, Cohen M, Seaberg EC. Cervical cancer incidence after up to 20 years of observation among women with HIV. Int J Cancer. 2017 Oct 15;141(8):1561-1565. doi: 10.1002/ijc.30866. Epub 2017 Jul 17. PMID: 28670714; PMCID: PMC5760214.

Cervical cancer screening intervals and management for women living with HIV: a risk benchmarking approach

We compared the risk of cervical cancer precursors in women with HIV to those in the general population to suggest better screening strategies. Most current guidelines for women with HIV were found to be suitable when compared to benchmarks from the general population. For instance, returning for screening every three years if CD4 count is high and there are no abnormalities, or every year if CD4 count is lower. However, some suggestions differed slightly from current guidelines, like recommending immediate colposcopy for certain HIV-positive women with abnormal results. Overall, current screening guidelines for women with HIV seem appropriate, and CD4 count can help tailor screening strategies.

Robbins HA, Strickler HD, Massad LS, Pierce CB, Darragh TM, Minkoff H, Keller MJ, Fischl M, Palefsky J, Flowers L, Rahangdale L, Milam J, Shrestha S, Colie C, D'Souza G. Cervical cancer screening intervals and management for women living with HIV: a risk benchmarking approach. *AIDS*. 2017 Apr 24;31(7):1035-1044. doi: 10.1097/QAD.0000000000001450. PMID: 28323758; PMCID: PMC5531443.

Multitype Infections With Human Papillomavirus: Impact of Human Immunodeficiency Virus Coinfection

Women with HIV are at a higher risk for genital infection with human papillomaviruses (HPV). Many women have multiple HPV types at the same time, especially those with HIV. A study found that 23% of HIV-positive women had multiple HPV types, compared to 5% of HIV-negative women. Those with multiple HPV types were usually younger, nonwhite, smokers, and had lower CD4 counts and higher HIV RNA levels. On average, 21% of HIV-positive women had multiple HPV types across visits. However, having multiple HPV types did not increase the risk of developing severe cervical abnormalities compared to having only one oncogenic HPV type.

Massad L, Keller M, Xie X, Minkoff H, Palefsky J, D'Souza G, Colie C, Villacres M, Strickler H. Multitype Infections With Human Papillomavirus: Impact of Human Immunodeficiency Virus Coinfection. *Sex Transm Dis*. 2016 Oct;43(10):637-41. doi: 10.1097/OLQ.0000000000000501. PMID: 27631359; PMCID: PMC5026395.

Association of cervical precancer with human papillomavirus types other than 16 among HIV co-infected women

Women with HIV have a higher risk of getting dangerous types of human papillomavirus (HPV) infections, which can lead to abnormal Pap test results and precancerous conditions in the cervix. However, their risk of developing cervical cancer is only slightly higher. One particularly harmful type of HPV, called HPV16, is less common among women with HIV compared to those without HIV, especially in cases of cervical precancer. This suggests that HPV16 may be better at avoiding the immune system in women with HIV than other harmful HPV types. This finding supports the use of vaccines that protect against multiple types of HPV in women with HIV.

Massad LS, Xie X, Burk RD, D'Souza G, Darragh TM, Minkoff H, Colie C, Burian P, Palefsky J, Atrio J, Strickler HD. Association of cervical precancer with human papillomavirus types other than 16 among HIV co-infected women. *Am J Obstet Gynecol*. 2016

Mar;214(3):354.e1-6. doi: 10.1016/j.ajog.2015.09.086. Epub 2015 Nov 14. PMID: 26433170; PMCID: PMC4775397.

Cervical Precancer Risk in HIV-Infected Women Who Test Positive for Oncogenic Human Papillomavirus Despite a Normal Pap Test

Identifying the risk of cervical precancer in HIV-infected women with normal Pap tests but positive for oncogenic human papillomavirus (oncHPV) is crucial for screening decisions. This study found that HIV-infected women who tested positive for HPV16 had a 13 times higher risk of CIN-3+ compared to those negative for oncHPV. Similarly, those with LSIL had a 9 times higher risk. This suggests that HIV-infected women with normal Pap results but HPV16 positive may need immediate colposcopy, similar to those with LSIL. For those with non-16 oncHPV, repeat screening in a year may be suitable.

Keller MJ, Burk RD, Massad LS, Eltoum IE, Hessol NA, Castle PE, Anastos K, Xie X, Minkoff H, Xue X, D'Souza G, Flowers L, Levine AM, Colie C, Rahangdale L, Fischl MA, Palefsky JM, Strickler HD. Cervical Precancer Risk in HIV-Infected Women Who Test Positive for Oncogenic Human Papillomavirus Despite a Normal Pap Test. Clin Infect Dis. 2015 Nov 15;61(10):1573-81. doi: 10.1093/cid/civ569. Epub 2015 Jul 17. PMID: 26187020; PMCID: PMC4614409.

Incidence of cervical precancers among HIV-seropositive women

The study looked at how HIV infection affects the occurrence of severe cervical changes (CIN). It found that 5% of HIV-positive women had the most severe form, CIN3+, compared to 2% of HIV-negative women. Less severe changes, CIN2+, were found in 12% of HIV-positive women and 4% of HIV-negative women. The rate of finding CIN3+ per year was 0.6 per 100 women among those with HIV and 0.2 per 100 women among those without HIV. Over time, the rate of finding severe changes decreased, especially after the first 2 years of the study. Overall, while HIV-positive women have more severe cervical changes than HIV-negative women, these changes are uncommon and become even less frequent with regular cervical screening.

Massad LS, Xie X, D'Souza G, Darragh TM, Minkoff H, Wright R, Colie C, Sanchez-Keeland L, Strickler HD. Incidence of cervical precancers among HIV-seropositive women. Am J Obstet Gynecol. 2015 May;212(5):606.e1-8. doi: 10.1016/j.ajog.2014.12.003. Epub 2014 Dec 10. PMID: 25499260; PMCID: PMC4416973.

Changes in knowledge of cervical cancer following introduction of human papillomavirus vaccine among women at high risk for cervical cancer

The study aimed to track changes in knowledge about cervical cancer prevention, HPV, and HPV vaccination among high-risk women over five years after HPV vaccination was introduced. Nearly 1,000 women participated, many of whom were minorities, had low income, and were smokers. Most had HIV. Overall, knowledge scores improved over the years, from 2007 to 2008-2009, and further by 2011. Higher scores were linked to higher income and education levels. New participants had similar scores to the ongoing group. Despite ongoing education efforts, many women still lacked understanding of HPV and cervical cancer prevention. Simplified educational interventions and easier access to vaccination may improve prevention efforts.

Massad LS, Evans CT, Weber KM, D'Souza G, Hessol NA, Wright RL, Colie C, Strickler HD, Wilson TE. Changes in knowledge of cervical cancer following introduction of human papillomavirus vaccine among women at high risk for cervical cancer. Gynecol Oncol Rep. 2015 Apr 1;12:37-40. doi: 10.1016/j.gore.2015.02.007. PMID: 25870859; PMCID: PMC4392650.

Accuracy of colposcopy in HIV seropositive and seronegative women with abnormal Pap tests

The purpose of this study is to compare the results of colposcopy in women with abnormal Pap tests who are HIV-positive and those who are HIV-negative. After adjusting for age and Pap test results, we found that HIV-positive women were more likely to have inadequate colposcopic examinations, abnormal colposcopic findings, and large cervical lesions than HIV-negative women. However, we did not find any differences in colposcopic characteristics, lesion size, and number between HIV-positive and HIV-negative women with abnormal colposcopy. To confirm colposcopic impression, a biopsy is necessary. Although HIV-positive women with abnormal cytology are more likely to have colposcopic abnormalities, the performance of colposcopy appears to be similar to that in HIV-negative women.

Stewart Massad L, D'Souza G, Darragh TM, Minkoff H, Wright R, Kassaye S, Sanchez-Keeland L, Evans CT. Accuracy of colposcopy in HIV seropositive and seronegative women with abnormal Pap tests. Gynecol Oncol. 2014 Dec;135(3):481-6. doi: 10.1016/j.ygyno.2014.08.007. Epub 2014 Aug 13. PMID: 25127986; PMCID: PMC4268004.

Long-term cumulative detection of human papillomavirus among HIV seropositive women

This study aimed to understand how HIV affects the detection of cervicovaginal human papillomavirus (HPV) infection. They analyzed data from 3438 women (2543 HIV-positive and 895 HIV-negative). Over eight years, HPV detection increased from 53% to 92% among HIV-positive women and from 22% to 66% among HIV-negative women. Carcinogenic and noncarcinogenic HPV were more common in HIV-positive women (67% and 89%, respectively) compared to HIV-negative women (36% and 56%). HPV16 and HPV18 were also more prevalent in HIV-positive women (15.2% and 15.0%) compared to HIV-negative women (6.7% and 6.1%). Lower CD4(+) cell count, age under 30, and smoking were linked to more frequent HPV detection. The study concluded that over 90% of HIV-positive women had HPV detected during the follow-up, while rates were lower among HIV-negative women, although most also developed HPV infections.

Massad LS, Xie X, Burk R, Keller MJ, Minkoff H, D'Souza G, Watts DH, Palefsky J, Young M, Levine AM, Cohen M, Strickler HD. Long-term cumulative detection of human papillomavirus among HIV seropositive women. AIDS. 2014 Nov 13;28(17):2601-8. doi: 10.1097/QAD.0000000000000455. PMID: 25188771; PMCID: PMC4289460.

Long-term cumulative incidence of cervical intraepithelial neoplasia grade 3 or worse after abnormal cytology: impact of HIV infection

The study aimed to figure out the long-term risk of cervical disease after an abnormal Pap test and how HIV affects this risk. Women from the Women's Interagency HIV Study were followed for up to 10 years. They found that HIV-positive women with abnormal Paps have a slightly higher long-term risk for cervical disease compared to HIV-negative women. However, most women with ASCUS or LSIL Pap results don't develop severe cervical issues despite being observed for years.

Massad LS, Pierce CB, Minkoff H, Watts DH, Darragh TM, Sanchez-Keeland L, Wright RL, Colie C, D'Souza G. Long-term cumulative incidence of cervical intraepithelial neoplasia grade 3 or worse after abnormal cytology: impact of HIV infection. Int J Cancer. 2014 Apr 15;134(8):1854-61. doi: 10.1002/ijc.28523. Epub 2013 Oct 29. PMID: 24170366; PMCID: PMC3947413.

Abnormal pap tests and human papillomavirus infections among HIV-infected and uninfected women who have sex with women

The study looked at how often women who have sex with women (WSW) have abnormal Pap tests and human papillomavirus (HPV) compared to women who only have sex with men (WSM), and how HIV affects this. They found that WSW had slightly lower chances of abnormal Pap tests and HPV than WSM. However, HIV-positive women, regardless of sexual preference, had higher risks of abnormal Pap tests and HPV. The study suggests that both WSW and WSM with HIV should be screened for these conditions equally.

Massad LS, Xie X, Minkoff H, Darragh TM, D'Souza G, Sanchez-Keeland L, Watts DH, Colie C, Strickler HD. Abnormal pap tests and human papillomavirus infections among HIV-infected and uninfected women who have sex with women. J Low Genit Tract Dis. 2014 Jan;18(1):50-6. doi: 10.1097/LGT.0b013e3182942733. PMID: 23959300; PMCID: PMC3905442.

Co-Morbidities

Carotid Artery Stiffness and Cognitive Decline Among Women With or at Risk for HIV Infection

We looked at how stiffening of blood vessels relates to cognitive decline in younger women with or at risk for HIV. Among 1662 women, most of whom were HIV-positive, we found that those with stiffer blood vessels had greater decline in cognitive function over a 10-year period. This decline was seen in tests measuring attention, processing speed, and executive function. Importantly, this decline was observed regardless of HIV status or related factors. Our findings underscore the importance of managing cardiovascular risk factors to prevent cognitive decline in this vulnerable population.

Huck DM, Hanna DB, Rubin LH, Maki P, Valcour V, Springer G, Xue X, Lazar J, Hodis HN, Anastos K, Kaplan RC, Kizer JR. Carotid Artery Stiffness and Cognitive Decline Among Women With or at Risk for HIV Infection. J Acquir Immune Defic Syndr. 2018 Jul 1;78(3):338-347. doi: 10.1097/QAI.0000000000001685. PMID: 29578932; PMCID: PMC5997527.

Underutilization of Statins When Indicated in HIV-Seropositive and Seronegative Women

As people with HIV live longer due to antiretroviral therapy, preventing and treating conditions like heart disease becomes more important. Guidelines suggest using statins to lower cholesterol, but it's unclear if HIV-positive individuals, especially women, are getting them when needed. We looked at statin use in the Women's Interagency HIV Study from

2000 to 2014. Only a small percentage of HIV-positive and negative women started statins within 5 years of needing them. HIV status didn't significantly affect statin initiation. Using certain guidelines would identify more HIV-positive women who could benefit from statins. Doctors should consider more aggressive treatment for high cholesterol in HIV-positive women.

Todd JV, Cole SR, Wohl DA, Simpson RJ Jr, Jonsson Funk M, Brookhart MA, Cocohoba J, Merenstein D, Sharma A, Lazar J, Milam J, Cohen M, Gange S, Lewis TT, Burkholder G, Adimora AA. Underutilization of Statins When Indicated in HIV-Seropositive and Seronegative Women. AIDS Patient Care STDS. 2017 Nov;31(11):447-454. doi: 10.1089/apc.2017.0145. PMID: 29087746; PMCID: PMC5665094.

Abuse, nocturnal stress hormones, and coronary heart disease risk among women with HIV

This study looked at abuse, cortisol, norepinephrine (NE), and heart disease risk in women with HIV. Participants from the Chicago Women's Interagency HIV Study (WIHS) were surveyed about recent abuse. The study found that while recent abuse wasn't linked to cortisol or NE levels, a higher NE/cortisol ratio was tied to higher heart disease risk, while higher cortisol was linked to lower heart disease risk. Women reporting more recent abuse had higher heart disease risk. Understanding these connections is crucial for addressing abuse and heart disease risk in women with HIV.

Dale SK, Weber KM, Cohen MH, Brody LR. Abuse, nocturnal stress hormones, and coronary heart disease risk among women with HIV. AIDS Care. 2017 May;29(5):598-602. doi: 10.1080/09540121.2016.1241378. Epub 2016 Oct 13. PMID: 27733045; PMCID: PMC5699459.

Vitamin D and insulin resistance in non-diabetic women's interagency HIV study participants

We studied how vitamin D levels relate to insulin resistance in 1082 women, 754 of whom had HIV, in the Women's Interagency HIV Study (WIHS) in the US. Vitamin D levels below 20-29 ng/mL were considered insufficient and less than 20 ng/mL were deficient. Insulin resistance was measured using the homeostasis model assessment (HOMA), with a value of ≥ 2.6 considered clinically significant. Initially, women with insufficient or deficient vitamin D were 1.62 and 1.70 times more likely to have high HOMA values, but this association disappeared after considering other factors linked to insulin resistance. Among HIV-infected women, using certain HIV medications remained linked to high HOMA values,

while vitamin D insufficiency had a weaker link after considering other factors. Factors like ethnicity, body mass index, smoking, and hepatitis C status were independently linked to insulin resistance in both HIV-infected and uninfected women. We found a slight link between vitamin D insufficiency and insulin resistance in HIV-infected women in the WIHS.

Adeyemi OM, Livak B, Orsi J, Glesby MJ, Villacres MC, Weber KM, Sharma A, Golub E, Young M, Cohen M, Tien PC. Vitamin D and insulin resistance in non-diabetic women's interagency HIV study participants. AIDS Patient Care STDS. 2013 Jun;27(6):320-5. doi: 10.1089/apc.2012.0400. Epub 2013 May 15. PMID: 23675750; PMCID: PMC3671624.

The association between diet and physical activity on insulin resistance in the Women's Interagency HIV Study

We studied how diet and physical activity relate to insulin resistance (IR) in HIV-infected and uninfected women. HIV-infected women tended to be older and more likely to have health insurance compared to uninfected women. In all women, factors like living in San Francisco, higher body mass index (BMI), and consuming more sweets were linked to higher HOMA-IR, a measure of IR. However, heavy intensity physical activity and higher income were linked to lower HOMA-IR. Among HIV-infected women, higher BMI and a history of protease inhibitor use were linked to higher HOMA-IR, while heavy intensity activity was marginally linked to lower HOMA-IR. Menopausal status was also marginally linked to higher HOMA-IR in HIV-infected women. These findings suggest that physical activity and a diet low in sugar may help reduce IR in urban women with or at risk for HIV infection. Therefore, promoting these healthy behaviors is important for overall health.

Hessol NA, Ameli N, Cohen MH, Urwin S, Weber KM, Tien PC. The association between diet and physical activity on insulin resistance in the Women's Interagency HIV Study. J Acquir Immune Defic Syndr. 2013 Jan 1;62(1):74-80. doi: 10.1097/QAI.0b013e318275d6a4. PMID: 23075914; PMCID: PMC3529765.

Frailty

Polypharmacy Is Associated With Falls in Women With and Without HIV

Among elder people falls may be the result of physical impairment but also drugs' adverse effects. In 1872 US women (of which 1315 were HIV-infected) the number and the type of drugs influenced the number of falls. The higher the number of total drugs or of drugs with

neuro-cognitive adverse-effects, the higher the number of falls. Therefore de-prescription and avoidance of medications with neurocognitive toxicities may be important in order to reduce falls.

Psomas CK, Hoover DR, Shi Q, Brown TT, Vance DE, Holman S, Plankey MW, Tien PC, Weber KM, Floris-Moore M, Bolivar HH, Golub ET, McDonnell Holstad M, Radtke KK, Tamraz B, Erlandson KM, Rubin LH, Sharma A. Polypharmacy Is Associated With Falls in Women With and Without HIV. J Acquir Immune Defic Syndr. 2022 Jul 1;90(3):351-359. doi: 10.1097/QAI.0000000000002955. PMID: 35333216; PMCID: PMC9203977.

Impaired Cognition Predicts Falls Among Women With and Without HIV Infection

Frailty and falls are common among HIV-infected middle-aged women. The study showed that frailty predicts recurrent falls, but not a single fall. In this cohort, HIV-infected women were more often frail and older than uninfected women. Unintentional weight loss is a component of frailty, and it independently predicts a single fall. Both unintentional weight loss and exhaustion are frailty components that independently predict recurrent falls. The study suggests that measuring frailty early among middle-aged women with or at risk for HIV can help identify future fall risk.

Sharma A, Vance DE, Hoover DR, Shi Q, Yin MT, Holman S, Plankey MW, Tien PC, Weber KM, Floris-Moore M, Bolivar HH, Golub ET, McDonnell Holstad M, Rubin LH. Impaired Cognition Predicts Falls Among Women With and Without HIV Infection. J Acquir Immune Defic Syndr. 2020 Mar 1;83(3):301-309. doi: 10.1097/QAI.0000000000002262. PMID: 31913989; PMCID: PMC7402636.

Frailty predicts fractures among women with and at-risk for HIV

The study aimed to find links between frailty and fractures in women, whether or not they had HIV. They found that women with HIV were generally older and more frail than those without HIV. Frailty was linked to the time it took for women to have their first fracture, both in those with and without HIV. Among women with HIV, frailty was also linked to the time between their first and second fractures. Overall, in this group of middle-aged women, frailty was a strong predictor of fracture risk, especially for those with HIV. As women with HIV get older, screening for frailty early on could help doctors identify who is most at risk of fractures.

Sharma A, Shi Q, Hoover DR, Tien PC, Plankey MW, Cohen MH, Golub ET, Gustafson D, Yin MT. Frailty predicts fractures among women with and at-risk for HIV. AIDS. 2019 Mar 1;33(3):455-463. doi: 10.1097/QAD.0000000000002082. PMID: 30702514; PMCID: PMC6361531.

Frailty as a predictor of falls in HIV-infected and uninfected women

Frailty and falls are common among HIV-infected middle-aged women. The study showed that frailty predicts recurrent falls, but not a single fall. In this cohort, HIV-infected women were more often frail and older than uninfected women. Unintentional weight loss is a component of frailty, and it independently predicts a single fall. Both unintentional weight loss and exhaustion are frailty components that independently predict recurrent falls. The study suggests that measuring frailty early among middle-aged women with or at risk for HIV can help identify future fall risk.

Sharma A, Hoover DR, Shi Q, Gustafson DR, Plankey MW, Tien PC, Weber KM, Yin MT. Frailty as a predictor of falls in HIV-infected and uninfected women. Antivir Ther. 2019;24(1):51-61. doi: 10.3851/IMP3286. PMID: 30604692; PMCID: PMC10141570.

Genetic Studies

Genetic predictor of working memory and prefrontal function in women with HIV

This study investigates how a gene called COMT can affect brain functions related to memory and decision-making, especially in people with HIV. Researchers focused on women and used various tests to understand how HIV and COMT genotype affect memory and decision-making abilities. Women with and without HIV took a working memory test and underwent brain scans while doing memory tasks. Results showed that women with HIV performed worse on the memory test compared to those without HIV. The study suggests that having both HIV and a specific COMT gene variation may cause memory problems and changes in brain function among HIV-infected individuals.

Sundermann EE, Bishop JR, Rubin LH, Little DM, Meyer VJ, Martin E, Weber K, Cohen M, Maki PM. Genetic predictor of working memory and prefrontal function in women with HIV. J Neurovirol. 2015 Feb;21(1):81-91. doi: 10.1007/s13365-014-0305-z. Epub 2014 Dec 17. PMID: 25515329; PMCID: PMC4319991.

Hepatitis and Liver Disease

Decreases in markers of monocyte/macrophage activation after hepatitis C eradication in HIV/hepatitis C virus coinfecting women

We looked at HIV positive women who had been cured of hepatitis C with medications. We measured blood markers of inflammation and activation of macrophages, a kind of white blood cell, before and after successful treatment for hepatitis C. We found that markers of inflammation decreased. We also looked at markers of liver damage and found that these improved with the treatment of hepatitis C, and, that the more the liver damage improved, the more the blood markers of inflammation improved.

French AL, Grennan D, Daubert E, Seaberg EC, Peters M, Augenbraun M, Fischl M, Kassaye S, Franco R, Kuniholm M, Adimora AA, Workowski K, Weber KM. Decreases in markers of monocyte/macrophage activation after hepatitis C eradication in HIV/hepatitis C virus coinfecting women. AIDS. 2021 Jul 15;35(9):1433-1438. doi: 10.1097/QAD.0000000000002869. PMID: 33710024; PMCID: PMC8845487.

Direct-Acting Antiviral Hepatitis C Treatment Cascade and Barriers to Treatment Initiation Among US Men and Women With and Without HIV

People living with HIV are more likely to also have hepatitis C virus (HCV) and face higher risks of liver-related health issues. This study looked at how HCV treatment is being used among men and women in the US who have HIV or are at risk of it. They found that HIV-positive women were more successful in getting treatment compared to HIV-negative women, and similar trends were seen in men. Black men and those using substances were less likely to receive treatment. Women who started treatment reported fewer personal obstacles, while men who didn't get treated faced more clinical barriers. HIV care might help in connecting people with HCV treatment and overcoming obstacles. Additional support may be needed for HIV-negative individuals, black men, and substance users to ensure they receive HCV treatment.

Haley DF, Edmonds A, Ramirez C, French AL, Tien P, Thio CL, Witt MD, Seaberg EC, Plankey MW, Cohen MH, Adimora AA. Direct-Acting Antiviral Hepatitis C Treatment Cascade and Barriers to Treatment Initiation Among US Men and Women With and Without HIV. J Infect Dis. 2021 Jun 15;223(12):2136-2144. doi: 10.1093/infdis/jiaa686. PMID: 33141170; PMCID: PMC8205633.

Contribution of Liver Fibrosis and Microbial Translocation to Immune Activation in Persons Infected With HIV and/or Hepatitis C Virus

We're not sure how much gut bacteria leaking into the bloodstream (microbial translocation) and liver scarring (fibrosis) each contribute to immune activation in people with HIV and/or hepatitis C virus (HCV). We found that both HIV and HCV are linked to higher sCD14 levels, and the effects add up if you have both infections. Our results suggest

that gut bacteria leaking into the bloodstream raises sCD14 levels in HIV, while liver scarring has a bigger impact in HCV. People with both infections might face the highest risk because of both factors affecting immune activation.

Reid M, Ma Y, Scherzer R, Price JC, French AL, Huhn GD, Plankey MW, Peters M, Grunfeld C, Tien PC. Contribution of Liver Fibrosis and Microbial Translocation to Immune Activation in Persons Infected With HIV and/or Hepatitis C Virus. J Infect Dis. 2018 Mar 28;217(8):1289-1297. doi: 10.1093/infdis/jix688. PMID: 29304196; PMCID: PMC6019002.

Macrophage Activation and the Tumor Necrosis Factor Cascade in Hepatitis C Disease Progression Among HIV-Infected Women Participating in the Women's Interagency HIV Study

People with both HIV and hepatitis C (HCV) see their liver disease worsen faster compared to those with just HCV, even when taking strong antiretroviral therapy. In women with both HIV and HCV, higher levels of sCD163, which show macrophage activation, and TNFR1I levels, indicating TNF-alpha system activation, were linked to liver disease getting worse. This adds to the evidence showing that macrophage activation and inflammation are linked to liver disease progression in HIV/HCV coinfection.

French AL, Martin JW, Evans CT, Peters M, Kessaye SG, Nowicki M, Kuniholm M, Golub E, Augenbraun M, Desai SN; WIHS. Macrophage Activation and the Tumor Necrosis Factor Cascade in Hepatitis C Disease Progression Among HIV-Infected Women Participating in the Women's Interagency HIV Study. J Acquir Immune Defic Syndr. 2017 Dec 1;76(4):438-444. doi: 10.1097/QAI.0000000000001524. PMID: 29077674; PMCID: PMC5679288.

Isolated Hepatitis B Core Antibody Status Is Not Associated With Accelerated Liver Disease Progression in HIV/Hepatitis C Coinfection

Hepatitis B core antibody (anti-HBc) is often found in the blood of people infected with HIV, but its significance is unclear. We conducted a study on women with HIV and hepatitis C virus (HCV) to determine whether the presence of anti-HBc affected the progression of liver disease over time. Our findings indicated that older age, lower CD4 count, not using antiretroviral therapy, and Hispanic ethnicity were associated with liver disease progression. However, we found no evidence to suggest that the presence of anti-HBc affected the progression of liver disease over a median period of 9.5 years among the HIV/HCV-coinfected women studied.

French AL, Hotton A, Young M, Nowicki M, Augenbraun M, Anastos K, Seaberg E, Rosenberg W, Peters MG. Isolated Hepatitis B Core Antibody Status Is Not Associated With Accelerated Liver Disease Progression in HIV/Hepatitis C Coinfection. J Acquir Immune

Defic Syndr. 2016 Jul 1;72(3):274-80. doi: 10.1097/QAI.0000000000000969. PMID: 26918547; PMCID: PMC4911240.

Liver Fibrosis Linked to Cognitive Performance in HIV and Hepatitis C

Even without cirrhosis, HIV can raise the risk of cognitive issues because it weakens the gut's defense against harmful substances. Even with effective treatment, about half of HIV patients still face cognitive problems. Liver problems like minimal hepatic encephalopathy, which leads to inflammation, can occur in those with cirrhosis, whether they have HIV or not. Moderate or severe liver scarring can harm learning, memory, and other brain functions. HIV and hepatitis C (HCV) also affect certain brain functions, but liver scarring has a bigger impact on cognitive abilities, including attention, memory, and thinking speed, regardless of HIV or HCV. However, the cognitive problems linked to liver scarring are different from those seen with minimal hepatic encephalopathy.

Valcour VG, Rubin LH, Obasi MU, Maki PM, Peters MG, Levin S, Crystal HA, Young MA, Mack WJ, Cohen MH, Pierce CB, Adimora AA, Tien PC; Women's Interagency HIV Study Protocol Team. Liver Fibrosis Linked to Cognitive Performance in HIV and Hepatitis C. J Acquir Immune Defic Syndr. 2016 Jul 1;72(3):266-73. doi: 10.1097/QAI.0000000000000957. PMID: 26885801; PMCID: PMC4911304.

Microbial translocation and liver disease progression in women coinfecting with HIV and hepatitis C virus

We wanted to find out if markers of microbial translocation are linked to liver disease progression in people who have both HIV and HCV. Microbial translocation is when bacteria from the gut enter the bloodstream and cause inflammation in other parts of the body. We looked at women who had both HIV and HCV and found that those who had liver disease progression had higher levels of certain markers in their blood over a 5-year period. These markers suggest that problems with the gut lining may play a role in how HIV and HCV interact and cause liver disease.

French AL, Evans CT, Agniel DM, Cohen MH, Peters M, Landay AL, Desai SN. Microbial translocation and liver disease progression in women coinfecting with HIV and hepatitis C virus. J Infect Dis. 2013 Aug 15;208(4):679-89. doi: 10.1093/infdis/jit225. Epub 2013 May 17. PMID: 23687224; PMCID: PMC3719907.

HIV Medication and Adherence

Integrase Inhibitors are Associated with Neuropsychiatric Symptoms in Women with HIV

We looked at how certain HIV medications affect neuropsychiatric symptoms in women living with HIV (WWH). We focused on two types of medications, efavirenz and integrase strand transfer inhibitors (INSTIs), which are known to have side effects. We studied different groups of WWH based on their health status and behaviors. We found that INSTIs, but not efavirenz, were linked to symptoms in specific groups of WWH. For example, among those with a history of low CD4 counts, dolutegravir and elvitegravir were associated with more stress and anxiety symptoms. Elvitegravir was also linked to more symptoms in women with well-controlled HIV and other health issues. However, these effects varied depending on factors like age and hepatitis status. This suggests that the risks and benefits of using dolutegravir and elvitegravir in WWH should be carefully considered based on individual characteristics.

Rubin LH, O'Halloran JA, Williams DW, Li Y, Fitzgerald KC, Dastgheyb R, Damron AL, Maki PM, Spence AB, Sharma A, Gustafson DR, Milam J, Weber KM, Adimora AA, Ofotokun I, Fischl MA, Konkle-Parker D, Xu Y. Integrase Inhibitors are Associated with Neuropsychiatric Symptoms in Women with HIV. J Neuroimmune Pharmacol. 2023 Jun;18(1-2):1-8. doi: 10.1007/s11481-021-10042-3. Epub 2022 Feb 17. PMID: 35178611; PMCID: PMC9381649.

Class-based antiretroviral exposure and cognition among women living with HIV (WLWH)

Disorders that affect the brain and memory are common among persons living with HIV. HIV treatment improves brain and memory function. However, there is evidence that certain HIV treatments can negatively effect brain and memory function. We studied the effect of HIV treatments on the brain and memory. There were more women with poor brain function over time. Over time women exposed to non-nucleoside reverse transcriptase inhibitors (a type of HIV treatment) improved verbal learning compared to other treated women living with HIV. Among women exposed to certain medications we found changes in brain function related to time on treatment. The rate of change of brain and memory function was similar between HIV-seropositive and women living with HIV.

Spence AB, Liu C, Rubin L, Aouizerat B, Vance DE, Bolivar H, Lahiri CD, Adimora AA, Weber K, Gustafson D, Sosanya O, Turner RS, Kassaye S. Class-Based Antiretroviral Exposure and

Cognition Among Women Living with HIV. AIDS Res Hum Retroviruses. 2022 Jul;38(7):561-570. doi: 10.1089/AID.2021.0097. Epub 2022 Mar 2. PMID: 35109713; PMCID: PMC9297324.

Weight and Body Mass Index Change After Switching to Integrase Inhibitors or Tenofovir Alafenamide Among Women Living with HIV

The study looked at weight and body mass index (BMI) changes in women with HIV who switched to integrase inhibitors (INSTIs) and/or tenofovir alafenamide (TAF) between 2006 and 2019. They analyzed data from 1,458 women enrolled in the Women's Interagency HIV Study who were on antiretroviral therapy (ART) and had at least one visit before and after the switch. The study found that women who switched to INSTIs alone, but not those who switched to TAF alone, had small but significant increases in weight and BMI. This increase was consistent across different types of INSTIs. In subgroup analyses based on BMI before the switch, only women who were not obese experienced increases in weight and BMI after switching to any ART regimen. These findings suggest that nonobese women who switch to INSTIs and/or TAF may experience slight increases in weight and BMI over a short period. Since obesity has long-term health consequences, it's important to identify women at risk of weight gain due to ART.

Lahiri CD, Xu Y, Wang K, Alvarez JA, Sheth AN, O'Halloran J, Spence AB, Tien P, Gustafson DR, Milam J, Fischl MA, Konkle-Parker D, Adimora AA, Sharma A, Weber KM, Ofotokun I, Rubin LH. Weight and Body Mass Index Change After Switching to Integrase Inhibitors or Tenofovir Alafenamide Among Women Living with HIV. AIDS Res Hum Retroviruses. 2021 Jun;37(6):461-467. doi: 10.1089/AID.2020.0197. Epub 2021 Jan 12. PMID: 33231474; PMCID: PMC8213005.

Integrase Strand Transfer Inhibitor Start or Switch Impacts Learning in Women With HIV

We looked at how starting or switching to integrase strand transfer inhibitors (INSTIs) for HIV treatment affected cognitive performance and depressive symptoms in women with HIV. We studied 639 women with HIV, most of whom were Black. While using any INSTI was linked to worse learning abilities after starting or switching treatment, specifically, using dolutegravir and elvitegravir, but not raltegravir, was associated with poorer learning. This was especially true for women who switched from other HIV medications to INSTIs. Interestingly, starting or switching to INSTIs didn't seem to affect depressive symptoms. These findings suggest that using INSTIs may impact learning abilities in women with HIV,

especially certain types like dolutegravir and elvitegravir, but they don't seem to influence depressive symptoms.

O'Halloran JA, Wang K, Spence AB, Williams DW, Dastgheyb R, Fitzgerald KC, Kamkwala AR, Maki PM, Sharma A, Gustafson DR, Milam J, Weber KM, Adimora AA, Ofotokun I, Fischl MA, Konkle-Parker D, Lahiri CD, Sheth AN, Xu Y, Rubin LH. Integrase Strand Transfer Inhibitor Start or Switch Impacts Learning in Women With HIV. J Acquir Immune Defic Syndr. 2021 Apr 15;86(5):593-599. doi: 10.1097/QAI.0000000000002608. PMID: 33394812; PMCID: PMC8319920.

Associations between Antiretroviral Drugs on Depressive Symptomatology in Homogenous Subgroups of Women with HIV

The connection between antiretroviral therapy (ART) and depression in women with HIV can be complex and vary depending on factors like age, health, and behavior. To understand this better, we split 3434 women into groups based on their characteristics and looked at how different ART drugs were linked to depressive symptoms. We found that certain drugs, like tenofovir, were often associated with more depressive symptoms across different groups, while others had varying effects depending on the subgroup. Surprisingly, drugs like dolutegravir and raltegravir weren't linked to depressive symptoms in any group. This shows that the relationship between ART drugs and depression in women with HIV is influenced by various factors like age, health status, and behavior.

Williams DW, Li Y, Dastgheyb R, Fitzgerald KC, Maki PM, Spence AB, Gustafson DR, Milam J, Sharma A, Adimora AA, Ofotokun I, Fischl MA, Konkle-Parker D, Weber KM, Xu Y, Rubin LH. Associations between Antiretroviral Drugs on Depressive Symptomatology in Homogenous Subgroups of Women with HIV. J Neuroimmune Pharmacol. 2021 Mar;16(1):181-194. doi: 10.1007/s11481-019-09899-2. Epub 2020 Jan 13. PMID: 31933016; PMCID: PMC7430262.

Associations between Antiretrovirals and Cognitive Function in Women with HIV

While modern HIV medicines are effective and safe, depression has been related to certain HIV medicines. We looked at the relationship between HIV medication regimens with depressive symptoms in women with HIV. We looked at these relationships in 3 different groups of women. The first group were women reporting elevated depressive symptoms during more than half of their study visits since study enrollment. The second group were women reporting elevated depressive symptoms less than half of their study visits. The third group never reported elevated depressive symptoms. Our analysis included 1,538 women living with HIV who participated in 12,924 visits (average visits was ~8). All of the

associations seen between HIV medicine regimens and depressive symptoms were only among the first group of women who reported elevated depressive symptoms during more than half of their study visits. HIV medication regimens including tenofovir alafenamide and either a cobicistat-boosted integrase inhibitor or protease inhibitor were associated with greater somatic symptoms (e.g., sleep issues, appetite issues, concentration difficulties) of depression, whereas those combinations containing tenofovir disoproxil fumarate and a non-nucleoside reverse transcriptase inhibitor were associated with less somatic depressive symptoms.

Rubin LH, Li Y, Fitzgerald KC, Dastgheyb R, Spence AB, Maki PM, Sharma A, Gustafson DR, Milam J, Weber KM, Adimora AA, Haughey NJ, Ofotokun I, Fischl MA, Konkle-Parker D, Xu Y, Williams DW. Associations between Antiretrovirals and Cognitive Function in Women with HIV. J Neuroimmune Pharmacol. 2021 Mar;16(1):195-206. doi: 10.1007/s11481-020-09910-1. Epub 2020 Mar 24. PMID: 32212091; PMCID: PMC7511435.

Starting or Switching to an Integrase Inhibitor-Based Regimen Affects PTSD Symptoms in Women with HIV

Integrase inhibitor (INSTI) drugs, increasingly used for long-term management of HIV, may lead to central nervous system (CNS) side effects, especially when starting or changing to them. Reports show they could affect PTSD symptoms, notably in women with HIV (WWH), who are already prone to mood and anxiety disorders. Overall, EVG-based regimens seemed beneficial for PTSD symptoms in WWH, regardless of whether they were new to treatment or switching from other drugs. RAL-based regimens were better than no treatment for PTSD symptoms but switching to RAL from other drugs worsened symptoms. DTG-based regimens either didn't change symptoms or made them worse. More research is needed to understand why different INSTIs affect stress symptoms differently in WWH.

Kamkwala AR, Wang K, O'Halloran J, Williams DW, Dastgheyb R, Fitzgerald KC, Spence AB, Maki PM, Gustafson DR, Milam J, Sharma A, Weber KM, Adimora AA, Ofotokun I, Sheth AN, Lahiri CD, Fischl MA, Konkle-Parker D, Xu Y, Rubin LH. Starting or Switching to an Integrase Inhibitor-Based Regimen Affects PTSD Symptoms in Women with HIV. AIDS Behav. 2021 Jan;25(1):225-236. doi: 10.1007/s10461-020-02967-2. PMID: 32638219; PMCID: PMC7948485.

Depression and Psychosocial Stress Are Associated With Subclinical Carotid Atherosclerosis Among Women Living With HIV

Women living with HIV (WLWH) have a greater risk of cardiovascular disease compared with HIV-negative women. Reasons for this increased risk are not well understood. One factor that could be contributing to the high risk of cardiovascular disease among WLWH is depression and stress. In the general population, depression, stress, and trauma are known to increase a person's risk of cardiovascular disease. The objective of this analysis was to see if depression, stress, and posttraumatic stress disorder (PTSD) were associated with the presence of plaque in the arteries among WLWH and HIV-negative women. We used data collected from 700 women in the Women's Interagency HIV Study (WIHS) who participated in a cardiovascular sub-study over seven years. Among WLWH, participants with depression, high perceived stress, and PTSD were more likely to have plaque in their arteries compared with participants without those conditions. WLWH who reported depression at more visits were more likely to develop new plaque. We did not see the same results for HIV-negative women, which might be because fewer HIV-negative women were in the study. In summary, depression and stress were associated with plaque in the arteries among WLWH. Further research is needed to see if helping with depression and stress can decrease the risk of plaque buildup in the arteries for WLWH.

Levy ME, Anastos K, Levine SR, Plankey M, Castel AD, Molock S, Sen S, Asch FM, Milam J, Aouizerat B, Weber KM, Golub ET, Kaplan RC, Kassaye S. Depression and Psychosocial Stress Are Associated With Subclinical Carotid Atherosclerosis Among Women Living With HIV. J Am Heart Assoc. 2020 Jul 7;9(13):e016425. doi: 10.1161/JAHA.120.016425. Epub 2020 Jun 22. PMID: 32564652; PMCID: PMC7670495.

Association of Pharmacogenetic Markers With Atazanavir Exposure in HIV-Infected Women

We found that a specific genetic variant, SORCS2 rs73208473, is linked to lower levels of atazanavir (ATV) in the blood of African American women with HIV. This suggests that genetics may play a role in how well this medication works for them.

Tamraz B, Huang Y, French AL, Kassaye S, Anastos K, Nowicki MJ, Gange S, Gustafson DR, Bacchetti P, Greenblatt RM, Hysi PG, Aouizerat BE; Women's Interagency HIV Study. Association of Pharmacogenetic Markers With Atazanavir Exposure in HIV-Infected Women. Clin Pharmacol Ther. 2020 Feb;107(2):315-318. doi: 10.1002/cpt.1605. Epub 2019 Sep 28. PMID: 31562781; PMCID: PMC10810687.

A Genome-Wide Association Study Identifies a Candidate Gene Associated With Atazanavir Exposure Measured in Hair

Hair can show how much atazanavir (ATV) someone has been exposed to over a long time. We did the first study looking at genes and ATV exposure in hair in a group of US women with HIV, called the Women's Interagency HIV Study. We looked at about 14.1 million gene changes (SNPs) and found one gene change, called rs73208473 in SORCS2, that was linked to lower ATV exposure. This gene change made ATV levels decrease by 0.46 times. We also checked other genes related to drugs, but didn't find any more that were linked to ATV exposure. This shows that studying genes can help us understand how drugs work in different people.

Tamraz B, Huang Y, French AL, Kassaye S, Anastos K, Nowicki MJ, Gange S, Gustafson DR, Bacchetti P, Greenblatt RM, Hysi PG, Aouizerat BE. A Genome-Wide Association Study Identifies a Candidate Gene Associated With Atazanavir Exposure Measured in Hair. Clin Pharmacol Ther. 2018 Nov;104(5):949-956. doi: 10.1002/cpt.1014. Epub 2018 Feb 8. PMID: 29315502; PMCID: PMC6037621.

Cognitive Burden of Common Non-antiretroviral Medications in HIV-Infected Women

As people with HIV age, they often have more health issues and take more non-HIV medications. Some of these medications can affect cognition, known as neurocognitive-adverse effects (NC-AE medications). We looked at how these medications impact cognitive function in women with and without HIV. HIV-positive (HIV+) women seem to be more affected by certain medications, like those for anxiety, seizures, and pain relief. These medications might interact with HIV in a way that worsens cognitive function. It's important for healthcare providers to consider these medications when evaluating cognitive problems in HIV+ women and weigh the benefits of treatment against potential cognitive side effects.

Rubin LH, Radtke KK, Eum S, Tamraz B, Kumanan KN, Springer G, Maki PM, Anastos K, Merenstein D, Karim R, Weber KM, Gustafson D, Greenblatt RM, Bishop JR. Cognitive Burden of Common Non-antiretroviral Medications in HIV-Infected Women. J Acquir Immune Defic Syndr. 2018 Sep 1;79(1):83-91. doi: 10.1097/QAI.0000000000001755. PMID: 29781879; PMCID: PMC6092212.

Use of Nonantiretroviral Medications That May Impact Neurocognition: Patterns and Predictors in a Large, Long-Term HIV Cohort Study

Neurocognitive impairment is common in people with HIV, and medications used to treat conditions other than HIV can also affect cognition. However, the role of these non-HIV medications in causing cognitive problems is often overlooked in HIV care. HIV infection

itself was linked to the use of medications that can cause cognitive issues, which might affect how we understand and treat neurocognitive problems in HIV. Healthcare providers should take into account the potential impact of these medications when assessing HIV patients with cognitive symptoms.

Radtke KK, Bacchetti P, Anastos K, Merenstein D, Crystal H, Karim R, Weber KM, Edmonds A, Sheth AN, Fischl MA, Vance D, Greenblatt RM, Rubin LH. Use of Nonantiretroviral Medications That May Impact Neurocognition: Patterns and Predictors in a Large, Long-Term HIV Cohort Study. J Acquir Immune Defic Syndr. 2018 Jun 1;78(2):202-208. doi: 10.1097/QAI.0000000000001658. PMID: 29762344; PMCID: PMC5962283.

HIV Progression and Mortality

Sex Differences in Human Immunodeficiency Virus Persistence and Reservoir Size During Aging

We don't know much about how HIV reservoirs differ between men and women. While in men, the reservoir decreases steadily with age, it's more variable in women. The total amount of HIV DNA decreases slower in women compared to men, but the part of the reservoir that can produce active virus increases in women after menopause.

Gianella S, Rawlings SA, Dobrowolski C, Nakazawa M, Chaillon A, Strain M, Layman L, Caballero G, Scully E, Scott B, Pacis C, Weber KM, Landay A, Anderson C, Karn J. Sex Differences in Human Immunodeficiency Virus Persistence and Reservoir Size During Aging. Clin Infect Dis. 2022 Aug 24;75(1):73-80. doi: 10.1093/cid/ciab873. PMID: 34612493; PMCID: PMC9402699.

Epidemiological evidence that common HPV types may be common because of their ability to evade immune surveillance: Results from the Women's Interagency HIV study

We studied how human papillomavirus (HPV) infections are affected by HIV and CD4 count in women. HPV type 16, the most cancer-causing type, seemed less affected by HIV status and CD4 count compared to other HPV types. This suggests that HPV 16 might have a unique ability to avoid being noticed by the immune system. We found similar patterns for HPV type 71. Interestingly, the most common HPV types in women without HIV seemed to be the ones least affected by the immune system. This suggests that these types might be better at avoiding immune detection, which could explain why they're so common.

Castle PE, Burk RD, Massad LS, Eltoun IE, Hall CB, Hessol NA, Anastos K, Xie X, Minkoff H, Xue X, D'Souza G, Flowers L, Colie C, Rahangdale L, Fischl MA, Palefsky JM, Strickler HD. *Epidemiological evidence that common HPV types may be common because of their ability to evade immune surveillance: Results from the Women's Interagency HIV study. Int J Cancer. 2020 Jun 15;146(12):3320-3328. doi: 10.1002/ijc.32693. Epub 2019 Oct 18. PMID: 31577842; PMCID: PMC7373334.*

Predicting death over 8 years in a prospective cohort of HIV-infected women: the Women's Interagency HIV Study

We aimed to predict mortality in middle-aged HIV-positive women on antiretroviral therapies (ART). We assessed three health indices: the Veterans Aging Cohort Study (VACS) for HIV, the Fried Frailty Index (FFI) for physical health, and the Center for Epidemiologic Studies-Depression (CES-D) for mental health among 1385 multiracial/ethnic ART-experienced HIV-positive women across six sites in the USA. The VACS Index emerged as the most significant predictor of death, followed by the FFI. CES-D score did not independently predict mortality. This study highlights the importance of considering physical and biological aging indices in predicting mortality among HIV-positive individuals.

Gustafson DR, Shi Q, Holman S, Minkoff H, Cohen MH, Plankey MW, Havlik R, Sharma A, Gange S, Gandhi M, Milam J, Hoover DR. *Predicting death over 8 years in a prospective cohort of HIV-infected women: the Women's Interagency HIV Study. BMJ Open. 2017 Jun 30;7(6):e013993. doi: 10.1136/bmjopen-2016-013993. PMID: 28667199; PMCID: PMC5577878.*

Cause-specific mortality among HIV-infected individuals, by CD4(+) cell count at HAART initiation, compared with HIV-uninfected individuals

The study aimed to compare the timing, proportion and risk of death from non-AIDS and AIDS among men and women who started HAART at different CD4 cell counts with the mortality risks of HIV-uninfected individuals with similar risk factors. Results showed that individuals who started treatment earlier were more likely to die of non-AIDS causes and at older ages as compared to those who started treatment later. The study found that the risk of non-AIDS death among HIV-infected individuals who started treatment early was nearly the same as that of HIV-uninfected individuals with similar risk factors. These findings suggest it is possible to reduce the risk of non-AIDS mortality among HIV-infected individuals to levels comparable to HIV-uninfected individuals.

Wada N, Jacobson LP, Cohen M, French A, Phair J, Muñoz A. *Cause-specific mortality among HIV-infected individuals, by CD4(+) cell count at HAART initiation, compared with*

HIV-uninfected individuals. AIDS. 2014;28(2):257-265.
doi:10.1097/QAD.000000000000078.

HIV RNA levels in plasma and cervical-vaginal lavage fluid in elite controllers and HAART recipients

HAART has been successful in controlling HIV replication, bringing levels similar to "elite controllers". However, we're uncertain if low-level replication continues in the body versus specific areas like mucosal sites. In "elite controllers", plasma viral load was higher than HAART users. This study found ongoing low-level HIV replication in "elite controllers", hinting at the potential benefit of HAART for them. Absent or very low HIV RNA in cervical-vaginal lavage (CVL) suggests minimal risk of sexual transmission for both groups.

Landay A, Golub ET, Desai S, Zhang J, Winkelman V, Anastos K, Durkin H, Young M, Villacres MC, Greenblatt RM, Norris PJ, Busch MP; Women's Interagency HIV Study. HIV RNA levels in plasma and cervical-vaginal lavage fluid in elite controllers and HAART recipients. AIDS. 2014 Mar 13;28(5):739-43. doi: 10.1097/QAD.000000000000150. PMID: 24326356; PMCID: PMC4160049.

Comparison of antibodies that mediate HIV type 1 gp120 antibody-dependent cell-mediated cytotoxicity in asymptomatic HIV type 1-positive men and women

Recent studies show that a specific type of antibodies called ADCC antibodies are crucial for protecting against HIV. For future HIV vaccines to be effective, they need to stimulate the production of these antibodies in both men and women. Early research suggested that men might have a stronger ADCC antibody response to HIV than women. We wanted to find out if this is true by comparing the ADCC response to HIV-1 gp120 in HIV-positive men and women. We studied 32 men and 32 women who were matched for factors like race, age, and HIV status. We found that both men and women had high levels of ADCC antibodies against HIV-1 gp120. The proportions of men and women with certain levels of these antibodies were similar. Also, the levels of ADCC antibodies were not different between men and women, nor did they correlate with factors like viral load or CD4(+) T cell count. Both groups also showed similar responses to different strains of HIV. In summary, both men and women with HIV had comparable levels of ADCC antibodies against HIV-1 gp120, suggesting that gender differences in this response may not be significant. However, more research is needed to see if differences emerge as the disease progresses.

Mata MM, Iwema JR, Dell S, Neems L, Jamieson BD, Phair J, Cohen MH, Anastos K, Baum LL. Comparison of antibodies that mediate HIV type 1 gp120 antibody-dependent cell-

mediated cytotoxicity in asymptomatic HIV type 1-positive men and women. AIDS Res Hum Retroviruses. 2014 Jan;30(1):50-7. doi: 10.1089/AID.2012.0377. Epub 2013 Sep 18. PMID: 23972002; PMCID: PMC3887406.

Cause-specific life expectancies after 35 years of age for human immunodeficiency syndrome-infected and human immunodeficiency syndrome-negative individuals followed simultaneously in long-term cohort studies, 1984-2008

During the HAART era, HIV-positive individuals in both MACS and WIHS cohorts tended to die at younger ages from non-AIDS-related causes compared to HIV-negative individuals (8.7 years younger in MACS and 7.6 years younger in WIHS). Factors like unemployment, depression, and hepatitis B or C infection were significantly associated with higher risks of both non-AIDS and AIDS mortality among HIV-positive individuals in the HAART era, regardless of the study cohort. These findings shed light on the evolving nature of mortality in the HIV-infected population.

Wada N, Jacobson LP, Cohen M, French A, Phair J, Muñoz A. Cause-specific life expectancies after 35 years of age for human immunodeficiency syndrome-infected and human immunodeficiency syndrome-negative individuals followed simultaneously in long-term cohort studies, 1984-2008. Am J Epidemiol. 2013;177(2):116-125. doi:10.1093/aje/kws321

Menopause

Obesity is associated with lower bacterial vaginosis prevalence in menopausal but not pre-menopausal women in a retrospective analysis of the Women's Interagency HIV Study

All women have bacteria in their vagina. Some types of bacteria in the vagina can be helpful to health while other types of bacteria can be harmful, but no one completely understands what causes changes in the types of bacteria in the vagina. We looked to see if the weight of a woman can affect the type of bacteria in the vagina. We found that obese women are more likely to have the helpful type of bacteria in the vagina than women with a normal weight, but only if the women are older. We also found that women with diabetes are more likely to have the more helpful type of bacteria, but only if the women are younger. This information may help us to understand what causes changes in the types of bacteria and help us to figure out ways to change the type of bacteria to benefit women's health.

Daubert E, Weber KM, French AL, Seidman D, Michel K, Gustafson D, Murphy K, Muzny CA, Alcaide M, Sheth A, Adimora AA, Spear GT. Obesity is associated with lower bacterial vaginosis prevalence in menopausal but not pre-menopausal women in a retrospective analysis of the Women's Interagency HIV Study. *PLoS One*. 2021 Mar 8;16(3):e0248136. doi: 10.1371/journal.pone.0248136. PMID: 33684141; PMCID: PMC7939367.

Cognitive changes during the menopausal transition: a longitudinal study in women with and without HIV

We wanted to see how cognitive abilities change during menopause in a group of mostly low-income women of color, including some with HIV. We found that overall, both the entire group and those with HIV showed declines in learning, memory, and attention as they went through menopause. These declines were significant and ranged from mild to severe cognitive impairment. This suggests that menopause has a big impact on cognitive function in this group of women.

Maki PM, Springer G, Anastos K, Gustafson DR, Weber K, Vance D, Dykxhoorn D, Milam J, Adimora AA, Kassaye SG, Waldrop D, Rubin LH. Cognitive changes during the menopausal transition: a longitudinal study in women with and without HIV. *Menopause*. 2021 Jan 11;28(4):360-368. doi: 10.1097/GME.0000000000001725. PMID: 33438895; PMCID: PMC8576848.

Cognitive profiles in perimenopause: hormonal and menopausal symptom correlates

During perimenopause, women may experience declines in attention, working memory, and verbal memory, although these changes vary from person to person. This study aimed to understand if there are specific patterns of cognitive changes during perimenopause and what factors might be associated with each pattern. They found four main cognitive profiles during perimenopause: Normal cognition (Profile 1), Weaknesses in verbal learning and memory (Profile 2), Strengths in verbal learning and memory (Profile 3), Strengths in attention and executive function (Profile 4). Profile 2, characterized by difficulties in verbal learning and memory, was linked to less hormonal fluctuations and more sleep problems compared to Profile 1. This indicates that there's a significant variation in cognitive abilities during perimenopause, with some women experiencing cognitive weaknesses while others do not. Understanding these cognitive profiles can help identify women who might be at risk of cognitive issues during perimenopause and guide the development of interventions to support them.

Maki PM, Springer G, Anastos K, Gustafson DR, Weber K, Vance D, Dykxhoorn D, Milam J, Adimora AA, Kassaye SG, Waldrop D, Rubin LH. Cognitive changes during the menopausal transition: a longitudinal study in women with and without HIV. *Menopause*. 2021 Jan 11;28(4):360-368. doi: 10.1097/GME.0000000000001725. PMID: 33438895; PMCID: PMC8576848.

Investigation of menopausal stage and symptoms on cognition in human immunodeficiency virus-infected women

During perimenopause, women may experience declines in attention, working memory, and verbal memory, although these changes vary from person to person. This study aimed to understand if there are specific patterns of cognitive changes during perimenopause and what factors might be associated with each pattern. They found four main cognitive profiles during perimenopause: Normal cognition (Profile 1), Weaknesses in verbal learning and memory (Profile 2), Strengths in verbal learning and memory (Profile 3), Strengths in attention and executive function (Profile 4). Profile 2, characterized by difficulties in verbal learning and memory, was linked to less hormonal fluctuations and more sleep problems compared to Profile 1. This indicates that there's a significant variation in cognitive abilities during perimenopause, with some women experiencing cognitive weaknesses while others do not. Understanding these cognitive profiles can help identify women who might be at risk of cognitive issues during perimenopause and guide the development of interventions to support them.

Rubin LH, Sundermann EE, Cook JA, Martin EM, Golub ET, Weber KM, Cohen MH, Crystal H, Cederbaum JA, Anastos K, Young M, Greenblatt RM, Maki PM. Investigation of menopausal stage and symptoms on cognition in human immunodeficiency virus-infected women. *Menopause*. 2014 Sep;21(9):997-1006. doi: 10.1097/GME.000000000000203. PMID: 24496085; PMCID: PMC4119867.

Depressive symptoms are increased in the early perimenopausal stage in ethnically diverse human immunodeficiency virus-infected and human immunodeficiency virus-uninfected women

The study aimed to understand how menopausal stages and vasomotor symptoms (like hot flashes) relate to depressive symptoms in women, especially those with HIV. They looked at 835 women with HIV (WWH) and 335 women without HIV (WWoH). Using a depression scale, they checked for elevated depressive symptoms. They found that women in early perimenopause were more likely to have elevated depressive symptoms compared to those in premenopause. This was the case for both WWH and WWoH. Continuous vasomotor symptoms also predicted elevated depressive symptoms. Interestingly, in

WWH, not taking antiretroviral treatment increased the likelihood of depressive symptoms during early perimenopause compared to premenopause. The study emphasizes the importance of screening and treating depression, especially in WWH experiencing changes in their menstrual cycles.

Maki PM, Rubin LH, Cohen M, Golub ET, Greenblatt RM, Young M, Schwartz RM, Anastos K, Cook JA. Depressive symptoms are increased in the early perimenopausal stage in ethnically diverse human immunodeficiency virus-infected and human immunodeficiency virus-uninfected women. Menopause. 2012 Nov;19(11):1215-23. doi: 10.1097/gme.0b013e318255434d. PMID: 22872013; PMCID: PMC3483358.

Mental Health & Well-being

A web-based positive-affect intervention to reduce stress and improve well-being in women living with HIV - feasibility and acceptability of a single-arm, pilot study

WLWH experience high rates of depression but remain underrepresented in mental health research. The study aimed to test the feasibility and acceptability of a five-week, self-guided, web-based positive affect skills intervention. The researchers found that the intervention was feasible and the WLWH who participated in the study reported that they would recommend the program to a friend and others living with HIV. Feedback from participants will be used to adapt and improve this intervention.

Freedman ME, Weber KM, Yohannes T, Cohen MH, Moskowitz JT. A web-based positive-affect intervention to reduce stress and improve well-being in women living with HIV - feasibility and acceptability of a single-arm, pilot study. AIDS Care. 2024;36(1):115-121.

Internalized HIV-Related Stigma and Neurocognitive Functioning Among Women Living with HIV

Sometimes people living with HIV accept negative views about themselves that some members of society hold. This study finds that those who accept negative views more have worse mental abilities compared to those who do not accept these views as much.

Thompson EC, Muhammad JN, Adimora AA, Chandran A, Cohen MH, Crockett KB, Goparaju L, Henderson E, Kempf MC, Konkle-Parker D, Kwait J, Mimiaga M, Ofotokun I, Rubin L, Sharma A, Teplin LA, Vance DE, Weiser SD, Weiss DJ, Wilson TE, Turan JM, Turan B. Internalized HIV-Related Stigma and Neurocognitive Functioning Among Women Living with

HIV. AIDS Patient Care STDS. 2022 Sep;36(9):336-342. doi: 10.1089/apc.2022.0041. PMID: 36099481; PMCID: PMC9810353.

Elevated Depressive Symptoms Are a Stronger Predictor of Executive Dysfunction in HIV-Infected Women Than in Men

Women with HIV (WWH) appear more prone to cognitive issues than HIV+ men, possibly due to mental health challenges. We looked at how depression affects cognitive abilities in women and men with and without HIV. Surprisingly, despite more depression among men, WWH with depression were five times more likely to have trouble with executive function compared to WLWH and three times more likely compared to men with HIV. Depression was linked to poorer performance in areas like processing speed, mental flexibility, and motor function for everyone, regardless of HIV status or gender. This suggests that treating depression could help improve cognitive function in people with HIV.

Rubin LH, Springer G, Martin EM, Seaberg EC, Sacktor NC, Levine A, Valcour VG, Young MA, Becker JT, Maki PM. Elevated Depressive Symptoms Are a Stronger Predictor of Executive Dysfunction in HIV-Infected Women Than in Men. J Acquir Immune Defic Syndr. 2019 Jul 1;81(3):274-283. doi: 10.1097/QAI.0000000000002029. PMID: 30893126; PMCID: PMC7254882.

HIV, Depression, and Cognitive Impairment in the Era of Effective Antiretroviral Therapy

We looked into how depression affects cognitive abilities in people with HIV. Studies showed high rates of depression among them, with about a quarter experiencing it currently and almost half at some point in their lives. Depression is linked to problems with cognitive skills in several areas like processing speed, memory, and decision-making. While there's not much research on how depression and HIV interact in causing these problems, it seems the connection between depression and cognitive issues is similar in both HIV-positive and negative individuals.

Rubin LH, Maki PM. HIV, Depression, and Cognitive Impairment in the Era of Effective Antiretroviral Therapy. Curr HIV/AIDS Rep. 2019;16(1):82-95. doi:10.1007/s11904-019-00421-0

Examining the Associations Between Immigration Status and Perceived Stress Among HIV-Infected and Uninfected Women

Stress is linked to poor mental and physical health. In the U.S., we studied stress levels among HIV-infected and immigrant women. We analyzed data from 305 women in the Women's Interagency HIV Study across New York, Chicago, and Los Angeles. We used the Perceived Stress Scale (PSS-10) to measure stress, confirmed HIV infection, and self-reported nativity status. Most participants were U.S.-born and HIV-infected. We found that being employed, having high social support, and being HIV-infected were associated with lower perceived stress. However, unstable housing was linked to higher stress levels. Immigration status didn't affect stress levels. We discovered higher stress among unemployed, unstably housed, and those with low social support. Interventions should target stress reduction strategies for these groups to improve health outcomes.

Gousse Y, Bruno D, Joseph MA, Afable A, Cohen MH, Weber KM, Milam J, Schwartz RM. Examining the Associations Between Immigration Status and Perceived Stress Among HIV-Infected and Uninfected Women. J Community Health. 2018 Dec;43(6):1172-1181. doi: 10.1007/s10900-018-0537-6. Erratum in: J Community Health. 2018 Jul 18;; PMID: 29926272.

HIV and symptoms of depression are independently associated with impaired glucocorticoid

Chronic inflammation from HIV can weaken the body's response to glucocorticoids, potentially leading to depression and related psychiatric issues. We studied women with and without HIV, some with depression, to see if HIV and depression together affect this response. We used data from the Women's Interagency HIV Study, dividing participants into four groups based on HIV status and depression. We looked at how their genes reacted to glucocorticoids using blood samples. While both depression and HIV were linked to changes in gene expression, only depression affected the immune response. Surprisingly, we found no combined effect of depression and HIV. Women with both conditions showed gene activity similar to those without HIV or depression, suggesting further complications in adapting to illness.

Bekhbat M, Mehta CC, Kelly SD, Vester A, Ofotokun I, Felger J, Wingood G, Anastos K, Gustafson DR, Kassaye S, Milam J, Aouizerat B, Weber K, Golub ET, Moore MF, Diclemente R, Fischl M, Kempf MC, Maki P, Neigh GN. HIV and symptoms of depression are independently associated with impaired glucocorticoid signaling. Psychoneuroendocrinology. 2018 Oct;96:118-125. doi: 10.1016/j.psyneuen.2018.06.013. Epub 2018 Jun 18. PMID: 29936334; PMCID: PMC6131054.

Life Lessons from Women with HIV: Mutuality, Self-Awareness, and Self-Efficacy

This study compared the life stories of women with HIV who manage their condition well with those who do not, to understand what factors predict better outcomes. Both groups were similar in demographics and the length of their stories. Researchers analyzed the

narratives and found that the well-managed group's stories often talked about (a) supportive relationships where both people care for each other, (b) understanding their strengths and weaknesses and how they affect their lives, and (c) actively dealing with challenges and using available resources. These findings suggest that having supportive relationships, self-awareness, and coping skills are important for women with HIV to take care of themselves and stay healthy.

Brody LR, Jack DC, Bruck-Segal DL, Ruffing EG, Firpo-Perretti YM, Dale SK, Weber KM, Cohen MH. Life Lessons from Women with HIV: Mutuality, Self-Awareness, and Self-Efficacy. AIDS Patient Care STDS. 2016 Jun;30(6):261-73. doi: 10.1089/apc.2016.0031. Epub 2016 May 23. PMID: 27214648; PMCID: PMC4913488.

Resilience Moderates the Association Between Childhood Sexual Abuse and Depressive Symptoms Among Women with and At-Risk for HIV

We looked at how childhood sexual abuse (CSA) affects the mental health and quality of life of women, both with and without HIV. We wanted to see if having resilience, or the ability to bounce back from difficult experiences, could lessen the impact of CSA on their mental health and quality of life. We found that having higher resilience was linked to fewer depressive symptoms and better quality of life for both HIV-positive and HIV-negative women. For women who had experienced CSA, having higher resilience was particularly important in reducing depressive symptoms. This suggests that interventions aimed at boosting resilience, especially for women who have experienced CSA, could help improve mental health and quality of life for both HIV-positive and HIV-negative women.

Dale SK, Weber KM, Cohen MH, Kelso GA, Cruise RC, Brody LR. Resilience Moderates the Association Between Childhood Sexual Abuse and Depressive Symptoms Among Women with and At-Risk for HIV. AIDS Behav. 2015;19(8):1379-1387. doi:10.1007/s10461-014-0855-3

The association of perceived stress and verbal memory is greater in HIV-infected versus HIV-uninfected women

In HIV-infected women from the Women's Interagency HIV Study (WIHS), verbal memory issues are a significant cognitive problem, which isn't solely explained by depression or substance abuse. This study looked at how perceived stress, measured using the Perceived Stress Scale (PSS-10), affects verbal memory performance, assessed using the Hopkins Verbal Learning Test (HVLT), in 1009 HIV-infected and 496 at-risk HIV-uninfected WIHS participants. HIV infection wasn't linked to higher perceived stress levels but was

associated with poorer verbal learning and memory, as well as attention. High stress was related to worse performance in these cognitive areas, regardless of HIV status, along with processing speed and executive function. Only among HIV-infected women, high stress was linked to lower verbal memory performance, especially on delayed verbal memory. This suggests that perceived stress contributes to verbal memory issues in WIHS women.

Rubin LH, Cook JA, Weber KM, Cohen MH, Martin E, Valcour V, Milam J, Anastos K, Young MA, Alden C, Gustafson DR, Maki PM. The association of perceived stress and verbal memory is greater in HIV-infected versus HIV-uninfected women. J Neurovirol. 2015 Aug;21(4):422-32. doi: 10.1007/s13365-015-0331-5. Epub 2015 Mar 20. PMID: 25791344; PMCID: PMC4562210.

Sexual minority women and depressive symptoms throughout adulthood

We wanted to see if there's a link between feeling down and sexual identity and behavior in women with or at risk for HIV. We looked at data from over 1800 women in different cities from 1994 to 2013. We compared how depressed they felt based on their sexual identity and who they had sex with. We also considered factors like age, money, history of violence, and substance use. We found that bisexual women and those who had sex with both men and women were more likely to feel down compared to heterosexual women and those who only had sex with men. This was especially true in early adulthood, but not so much as they got older. So, the experience of feeling down might be different for women with different sexual identities and behaviors, especially those with or at risk for HIV.

Pyra M, Weber KM, Wilson TE, Cohen J, Murchison L, Goparaju L, Golub ET, Cohen MH. Sexual minority women and depressive symptoms throughout adulthood. Am J Public Health. 2014 Dec;104(12):e83-90. doi: 10.2105/AJPH.2014.302259. Epub 2014 Oct 16. PMID: 25320890; PMCID: PMC4232124.

Gender Roles and Mental Health in Women With and at Risk for HIV

A study examined the gender roles and mental health of low-income African American women in the community, both with and without HIV. Women were assessed for their gender roles in relationships, including self-silencing, unmitigated communion, and power in sexual relationships. Those with HIV reported higher levels of self-silencing and lower quality of life compared to those without HIV. For both groups, higher self-silencing and unmitigated communion were linked to more depressive symptoms and lower quality of life. The study suggests that interventions promoting self-care and self-advocacy in

relationships could help reduce depressive symptoms and improve quality of life for women with or at risk for HIV.

Brody LR, Stokes LR, Dale SK, Kelso GA, Cruise RC, Weber KM, Burke-Miller JK, Cohen MH. Gender Roles and Mental Health in Women With and at Risk for HIV. Psychol Women Q. 2014 Sep 1;38(3):311-326. doi: 10.1177/0361684314525579. PMID: 25492991; PMCID: PMC4258411.

Do HIV-positive women receive depression treatment that meets best practice guidelines?

This study looked at whether depressed HIV+ women received proper treatment according to established standards. We surveyed 1,352 HIV-positive women and assessed their depressive symptoms and mental health care. We found that 46.2% of women with major depressive disorder and 37.9% of those with clinically significant depressive symptoms received adequate treatment. Factors associated with receiving proper treatment included having the same primary care provider, reporting poorer role functioning, paying for healthcare out-of-pocket, and not being African American or Hispanic/Latina. This suggests that ensuring consistent healthcare providers, reaching out to those with lower role functioning, and addressing the specific needs of African American and Hispanic/Latina women could increase the likelihood of receiving adequate depression treatment.

Cook JA, Burke-Miller JK, Grey DD, Cocohoba J, Liu C, Schwartz RM, Golub ET, Anastos K, Steigman PJ, Cohen MH. Do HIV-positive women receive depression treatment that meets best practice guidelines? AIDS Behav. 2014 Jun;18(6):1094-102. doi: 10.1007/s10461-013-0679-6. PMID: 24402689; PMCID: PMC4020946.

Microbiota

Declining Prevalence of *Trichomonas vaginalis* Diagnosed by Wet Mount in a Cohort of U.S. Women With and Without HIV

The study aimed to find differences in *Trichomonas vaginalis* (TV) prevalence among women living with HIV (WLWH) over time. Results showed that TV rates are low among WLWH and HIV does not increase TV risk. Therefore, screening for TV may be helpful for

newly diagnosed WLWH, women with risk factors, or those receiving care irregularly, but it is unlikely to further reduce the low rate of TV among women in care, especially older women without multiple partners.

Daubert EM, Dionne J, Atrio J, Knittel AK, Kassaye SG, Seidman D, Long A, Brockmann S, Ofotokun I, Fischl MA, Massad LS, Weber KM. Declining Prevalence of Trichomonas vaginalis Diagnosed by Wet Mount in a Cohort of U.S. Women With and Without HIV. J Womens Health (Larchmt). 2024 Mar;33(3):388-395. doi: 10.1089/jwh.2023.0263. Epub 2024 Jan 12. PMID: 38215275; PMCID: PMC10924113.

Association of Gut Microbiota With Objective Sleep Measures in Women With and Without Human Immunodeficiency Virus Infection: The IDOze Study

Poor sleep health is often overlooked, especially for people with HIV. The study aimed to learn more about the connection between gut bacteria and sleep. Researchers found that seventeen different groups of microorganisms are linked to sleep quality and timing. One of these groups, called Butyricimonas, seems to be especially important for maintaining healthy sleep continuity. However, Butyricimonas is less common in women with HIV.

Zhang Y, Lin CL, Weber KM, Xing J, Peters BA, Sollecito CC, Grassi E, Wiek F, Xue X, Seaberg EC, Gustafson D, Anastos K, Sharma A, Burgess HJ, Burk RD, Qi Q, French AL. Association of Gut Microbiota With Objective Sleep Measures in Women With and Without Human Immunodeficiency Virus Infection: The IDOze Study. J Infect Dis. 2023 Nov 11;228(10):1456-1466. doi: 10.1093/infdis/jiad371. PMID: 37650624; PMCID: PMC10640774.

Trends in Bacterial Vaginosis Prevalence in a Cohort of U.S. Women with and at Risk for HIV

Women living with HIV often have changes in the normal bacteria of the vagina called bacterial vaginosis (BV). BV can lead to discharge and odor and has been associated with pregnancy complications and infections after gynecologic surgery. Women in WIHS were assessed for BV at every visit by examination of vaginal secretions with a microscopy. Previous work from WIHS showed that BV was not associated with HIV but rather with sexual practices (condom use, multiple partners), African American race, and younger age. However, we have not looked at BV among women from recently launched Southern sites, and we have not looked across visits. This paper does that and shows that BV fell after the first WIHS visit and then declined more slowly across time. While we saw moderate difference in BV across different sites, Southern sites did not have a uniform increase or

decrease in BV risk. These results suggest that repeatedly looking for BV in women at risk may contribute to a decline in BV across time, although some of the decrease in BV with time may be due to our cohort growing older. Further research is needed, including whether treatment results in sustained disappearance of BV and whether women living with HIV require longer therapy for BV to go away.

Massad LS, Daubert EM, Evans CT, Minkoff H, Kassaye S, Dionne-Odom J, Seidman D, Murphy K, Alcaide ML, Adimora AA, Sheth AN, Golub ET, French AL, Weber KM. Trends in Bacterial Vaginosis Prevalence in a Cohort of U.S. Women with and at Risk for HIV. J Womens Health (Larchmt). 2022 May;31(5):726-732. doi: 10.1089/jwh.2021.0102. Epub 2021 Aug 27. PMID: 34449258; PMCID: PMC9133967.

HIV Status Does Not Affect Rectal Microbiome Composition, Diversity, or Stability over Time: A Chicago Women's Interagency HIV Study

We studied the gut microbiota of women with and without HIV with similar backgrounds in the Chicago WIHS. We used DNA sequencing to analyze bacterial RNA genes from rectal swabs. We found that HIV status didn't affect the diversity of gut bacteria, how they clustered together, or the number of specific bacteria types. Both groups had stable microbiomes over time.

Williams B, Weber K, Chlipala G, Evans C, Morack R, French A. HIV Status Does Not Affect Rectal Microbiome Composition, Diversity, or Stability over Time: A Chicago Women's Interagency HIV Study. AIDS Res Hum Retroviruses. 2019;35(3):260-266. doi:10.1089/AID.2018.0250

Correlates of Bacterial Vaginosis Over Long-Term Follow-Up: Impact of HIV Infection

Bacterial vaginosis (BV) is not fully understood, especially in women with HIV. In a study spanning over two decades, researchers followed HIV-positive and HIV-negative women. They found BV was diagnosed less often in HIV-positive women compared to HIV-negative ones. Factors linked to BV included younger age, ethnicity, lower income, less education, certain behaviors like drinking and smoking, depression, and having sex with men. Hormonal contraception and menopause seemed to reduce the risk of BV. BV recurred in many women within a year, but HIV status didn't affect this. The study didn't find any changes in BV rates over time. Overall, BV is common in both HIV-positive and at-risk women, and it's more related to behavior and culture than HIV status.

Massad LS, Evans CT, Kang R, Hotton A, Greenblatt R, Minkoff H, Murphy K, Colie C, Weber KM. Correlates of Bacterial Vaginosis Over Long-Term Follow-Up: Impact of HIV Infection. *AIDS Res Hum Retroviruses*. 2017 May;33(5):432-439. doi: 10.1089/AID.2016.0213. Epub 2016 Dec 16. PMID: 27841674; PMCID: PMC5439437.

The Cervicovaginal Microbiota and Its Associations With Human Papillomavirus Detection in HIV-Infected and HIV-Uninfected Women

Bacterial vaginosis is a condition where there are fewer *Lactobacillus* bacteria in the vagina, leading to a higher pH and more immune cell activity. This condition has been linked to an increased risk of human papillomavirus (HPV) infection. To better understand the relationship between HPV and the microbiota, we studied the cervicovaginal microbiota in women over time, both with and without HIV, taking immune status into account. We found that high levels of *Lactobacillus crispatus* and other *Lactobacillus* species were associated with lower vaginal pH. We also found that higher levels of *L. crispatus* were associated with a lower rate of HPV detection, independent of pH. This suggests that *L. crispatus* may have a positive effect on HPV burden in women, regardless of their HIV status.

Reimers LL, Mehta SD, Massad LS, Burk RD, Xie X, Ravel J, Cohen MH, Palefsky JM, Weber KM, Xue X, Anastos K, Minkoff H, Atrio J, D'Souza G, Ye Q, Colie C, Zolnik CP, Spear GT, Strickler HD. The Cervicovaginal Microbiota and Its Associations With Human Papillomavirus Detection in HIV-Infected and HIV-Uninfected Women. *J Infect Dis*. 2016 Nov 1;214(9):1361-1369. doi: 10.1093/infdis/jiw374. Epub 2016 Aug 11. PMID: 27521363; PMCID: PMC5079369.

The vaginal microbiota over an 8- to 10-year period in a cohort of HIV-infected and HIV-uninfected women

We looked at the types of bacteria in the vaginas of 64 women over an average of 8.1 years. We found six main types of bacteria communities. The ones with the most *Lactobacillus* bacteria increased over time, while those with less *Lactobacillus* decreased. HIV status didn't affect these bacteria types. Smoking was linked to certain types of bacteria. Overall, the vaginal bacteria improved over time in women at risk for HIV.

Mehta SD, Donovan B, Weber KM, Cohen M, Ravel J, Gajer P, Gilbert D, Burgad D, Spear GT. The vaginal microbiota over an 8- to 10-year period in a cohort of HIV-infected and HIV-uninfected women. *PLoS One*. 2015 Feb 12;10(2):e0116894. doi: 10.1371/journal.pone.0116894. PMID: 25675346; PMCID: PMC4326357.

Neuropsychiatric

Gut Microbiota and Cognitive Function Among Women Living with HIV

Gut microbiota are the microorganisms that live in the digestive tracts of humans and animals, including bacteria, archaea, fungi, and viruses. It has been proposed that these microorganisms could play a role in the development of cognitive diseases through the gut-brain-axis, a two-way biochemical communications between the gastrointestinal tract and the central nervous system. People living with HIV are at increased risk for imbalance in the gut microorganisms as well as neurocognitive disorders. We conducted this study to examine if the gut bugs are important in cognitive impairment and which specific bugs are contributing to the condition among women living with HIV. We found that greater abundance of Methanobrevibacter, Odoribacter, Pyramidobacter, Eubacterium, Ruminococcus, and Gemmiger, and lower abundance of Veillonella were associated with increased risk for cognitive impairment, and especially impaired learning and memory. We also found several altered microbial metabolic pathways that may play a role in cognitive impairment, including pathways related to generation of energy and natural products, such as vitamin B2, in bacteria cells. This study provides evidence linking gut microbiota to the development of cognitive impairment among women living with HIV.

Hua S, Peters BA, Lee S, Fitzgerald K, Wang Z, Sollecito CC, Grassi E, Wiek F, St Peter L, D'Souza G, Weber KM, Kaplan RC, Gustafson D, Sharma A, Burk RD, Rubin LH, Qi Q. Gut Microbiota and Cognitive Function Among Women Living with HIV. J Alzheimers Dis. 2023;95(3):1147-1161. doi: 10.3233/JAD-230117. PMID: 37661881; PMCID: PMC10771810.

Midlife body mass index, central adiposity and neuropsychological performance over 10 years in women living with and without HIV

Obesity is related to thinking. There are not many data available for women on obesity and thinking, especially for women with HIV infection. Our results show that overweight and obesity are not very much related to thinking during middle age in women who have HIV and women who do not have HIV.

Vásquez E, Kuniholm MH, Appleton AA, Rubin LH, Adimora AA, Fischl MA, Fox E, Mack WJ, Holman S, Moran CA, Minkoff H, Plankey MW, Sharma A, Tien PC, Weber KM, Gustafson DR. Midlife body mass index, central adiposity and neuropsychological performance over 10 years in women living with and without HIV. *Front Endocrinol (Lausanne)*. 2023 Jul 7;14:1108313. doi: 10.3389/fendo.2023.1108313. PMID: 37484940; PMCID: PMC10361616.

Glucocorticoid Receptor Function and Cognitive Performance in Women With HIV

People living with HIV develop diseases of aging more often than people without HIV of the same age. The glucocorticoid receptor is the binding site of stress hormones in the body and it determines how much of certain genes are expressed in the body. The genes controlled by the glucocorticoid receptor are involved in energy use in the body. Also, the glucocorticoid receptor is able to stop inflammation in the body. Because the glucocorticoid receptor can change energy and inflammation in the body, changes in the glucocorticoid receptor can change the way the brain works and the way people learn and remember. HIV may change the function of the glucocorticoid receptor and this change may cause both inflammation and poor function of the brain. This study found that in women living with HIV over 50 years old, the function of the glucocorticoid receptor was more predictive of memory performance suggesting a greater influence on neural function with the combined conditions of HIV and greater age. These data may indicate a greater susceptibility of the brain to stress in older women with HIV.

Rubin LH, Bekhbat M, Turkson S, Mehta CC, Maki PM, Anastos K, Gustafson D, Spence AB, Milam J, Chow FC, Weber K, Springer G, Gange SJ, Neigh GN. *Glucocorticoid Receptor Function and Cognitive Performance in Women With HIV*. *Psychosom Med*. 2022 Oct 1;84(8):893-903. doi: 10.1097/PSY.0000000000001126. Epub 2022 Aug 20. PMID: 36044614; PMCID: PMC9553273.

T-cell activation state differentially contributes to neuropsychiatric complications in women with HIV

Cognition and mental health problems are common among women with HIV. The mechanisms underlying these problems are not fully known but are likely driven by immune modulation. We examined associations between T-cell activation states which are needed to mount an effective immune response and cognitive and mental health outcomes in women with HIV. We found that T-cell states contribute to cognition and in women with HIV.

Williams DW, Flores BR, Xu Y, Wang Y, Yu D, Peters BA, Adedimeji A, Wilson TE, Merenstein D, Tien PC, Cohen MH, Weber KM, Adimora AA, Ofotokun I, Fischl M, Turan J, Turan B, Laumet G, Landay AL, Dastgheyb RM, Gange SJ, Weiser SD, Rubin LH. T-cell activation state differentially contributes to neuropsychiatric complications in women with HIV. *Brain Behav Immun Health*. 2022 Aug 29;25:100498. doi: 10.1016/j.bbih.2022.100498. PMID: 36097532; PMCID: PMC9463560.

Class-Based Antiretroviral Exposure and Cognition Among Women Living with HIV

Disorders that affect the brain and memory are common among persons living with HIV. HIV treatment improves brain and memory function. However, there is evidence that certain HIV treatments can negatively effect brain and memory function. We studied the effect of HIV treatments on the brain and memory. There were more women with poor brain function over time. Over time women exposed to non-nucleoside reverse transcriptase inhibitors (a type of HIV treatment) improved verbal learning compared to other treated women living with HIV. Among women exposed to certain medications we found changes in brain function related to time on treatment. The rate of change of brain and memory function was similar between HIV-seropositive and women living with HIV.

Spence AB, Liu C, Rubin L, Aouizerat B, Vance DE, Bolivar H, Lahiri CD, Adimora AA, Weber K, Gustafson D, Sosanya O, Turner RS, Kassaye S. *Class-Based Antiretroviral Exposure and Cognition Among Women Living with HIV*. *AIDS Res Hum Retroviruses*. 2022 Jul;38(7):561-570. doi: 10.1089/AID.2021.0097. Epub 2022 Mar 2. PMID: 35109713; PMCID: PMC9297324.

Degree of Polypharmacy and Cognitive Function in Older Women with HIV

Many older people with HIV experience age-related conditions (e.g., depression, diabetes, hypertension) that require needing to be treated with medications that can also cause cognitive impairment. We examined the relationship between the number of non-antiretroviral (ART) medications and memory and other mental abilities in WIHS participants 50 years of age and greater. 887 women were included in the analysis. In all women, 35% reported taking 5-9 non-ART medications. 22% reported taking 10 or more non-ART medications. The numbers were similar in women with HIV only. In all women, we found that women taking 10 or more medications vs. 0-4 non-ART medications performed poorer on areas of memory and other mental abilities (executive function, processing speed, and motor function). A similar pattern of findings were seen in women with HIV only--except motor function. Taking 5-9 non-ART medications was not associated with memory and other mental abilities. It seems that taking 10 or more medications (also

known as severe polypharmacy) is associated with certain aspects of cognition. Balancing the risks/benefits related to each non-ART medication seems important in this population of women.

Rubin LH, Neijna AG, Shi Q, Hoover DR, Tamraz B, Anastos K, Edmonds A, Fischl MA, Gustafson D, Maki PM, Merenstein D, Sheth AN, Springer G, Vance D, Weber KM, Sharma A. Degree of Polypharmacy and Cognitive Function in Older Women with HIV. AIDS Res Hum Retroviruses. 2022 Jul;38(7):571-579. doi: 10.1089/AID.2021.0231. Epub 2022 Apr 26. PMID: 35357949; PMCID: PMC9297323.

Body Mass Index and Leptin Are Related to Cognitive Performance Over 10 Years in Women With and Without HIV Infection

This study examined whether body mass index (BMI) and leptin levels were linked with neuropsychological performance (NP) over a 10-year period in middle-aged women with and without HIV. The results showed that higher BMI and leptin levels were associated with poorer performance across different NP domains in both groups. This suggests that tracking changes in adiposity measures over time could help us better understand the impact of adipose tissue on brain health as we age.

Macaluso F, Weber KM, Rubin LH, Dellinger E, Holman S, Minkoff H, Keating S, Merlin LR, Gustafson DR. Body Mass Index and Leptin Are Related to Cognitive Performance Over 10 Years in Women With and Without HIV Infection. J Clin Endocrinol Metab. 2022 Feb 17;107(3):e1126-e1135. doi: 10.1210/clinem/dgab759. PMID: 34677589; PMCID: PMC8851924.

Dietary intake is associated with neuropsychological impairment in women with HIV

Diet may influence cognition in people living with HIV. We looked at what women with HIV and women without HIV were eating and how it related to their cognitive abilities. Overall, the types of food eaten were similar between the two groups, except HIV-negative women drank more sweet beverages. In women with HIV, eating more processed meat, sweet beverages, fish, and whole milk was linked to higher chances of having cognitive problems. Eating more vegetables, on the other hand, was linked to lower chances of cognitive problems. However, in women without HIV, we didn't find any connections between what they ate and their cognitive abilities. This suggests that what you eat could affect your brain differently depending on whether you have HIV or not. More research with better methods is needed to understand this better.

Rubin LH, Gustafson DR, Warrior L, Sheira L, Fitzgerald KC, Dastgheyb R, Weber KM, Tien PC, French A, Spence AB, Sharma A, Williams DW, White CJ, Seaberg EC, Frongillo EA, Weiser SD. *Dietary intake is associated with neuropsychological impairment in women with HIV. Am J Clin Nutr.* 2021 Jul 1;114(1):378-389. doi: 10.1093/ajcn/nqab038. PMID: 33829235; PMCID: PMC8246600.

Neurocognitive Complications of HIV Infection in Women: Insights from the WIHS Cohort

We know that women with HIV might be more at risk for cognitive problems than men with HIV due to various factors like hormones, immune system differences, and challenges like poverty and mental health issues. We looked at findings from the WIHS and other research on cognitive issues in women with HIV. We found that women with HIV might be more vulnerable to cognitive problems than men, and their cognitive issues might show different patterns. Factors like inflammation, hormones, genetics, mental health, substance use, and other health problems may contribute to these differences. This highlights the need to consider gender when studying cognitive problems in HIV and suggests areas for further research.

Rubin LH, Maki PM. *Neurocognitive Complications of HIV Infection in Women: Insights from the WIHS Cohort. Curr Top Behav Neurosci.* 2021;50:175-191. doi: 10.1007/7854_2019_101. PMID: 31396894.

Patterns and Predictors of Cognitive Function Among Virally Suppressed Women With HIV

Cognitive issues are common and varied among women with virally suppressed HIV. We studied 929 of these women and 717 HIV-negative women to understand their cognitive abilities using various tests. Among those with HIV, we found nine groups, with four showing normal cognitive function and five showing different kinds of impairment. We found that factors like where they received treatment, age, education, and substance use were important. Each impaired group had its own set of factors that affected their cognitive abilities. These findings show that cognitive issues in women with HIV vary, and certain factors might contribute to these problems.

Dastgheyb RM, Buchholz AS, Fitzgerald KC, Xu Y, Williams DW, Springer G, Anastos K, Gustafson DR, Spence AB, Adimora AA, Waldrop D, Vance DE, Milam J, Bolivar H, Weber KM, Haughey NJ, Maki PM, Rubin LH. *Patterns and Predictors of Cognitive Function Among*

Virally Suppressed Women With HIV. Front Neurol. 2021 Feb 11;12:604984. doi: 10.3389/fneur.2021.604984. PMID: 33679577; PMCID: PMC7928382.

Factors Predicting Detrimental Change in Declarative Memory Among Women With HIV: A Study of Heterogeneity in Cognition

We used a new method to look at how memory changes over time in HIV-positive and HIV-negative women. Among HIV-positive African American women, we found four groups: one with little decline, two with faster decline, and one with stable but lower memory. Among HIV-negative African American women, we found one group with little decline and two with faster decline. In HIV-positive women, those with faster decline were less educated and more likely to have a history of depression. We found similar groups in white/other HIV-positive and HIV-negative women. Our study suggests that memory decline varies among women depending on race and HIV status. We need to understand why this happens and find ways to help those at risk of faster decline.

Fitzgerald KC, Maki PM, Xu Y, Jin W, Dastgheyb R, Williams DW, Springer G, Anastos K, Gustafson D, Spence AB, Adimora AA, Waldrop D, Vance DE, Bolivar H, Valcour VG, Rubin LH. Factors Predicting Detrimental Change in Declarative Memory Among Women With HIV: A Study of Heterogeneity in Cognition. Front Psychol. 2020 Oct 15;11:548521. doi: 10.3389/fpsyg.2020.548521. PMID: 33178064; PMCID: PMC7594511.

Brief Report: Higher Peripheral Monocyte Activation Markers Are Associated With Smaller Frontal and Temporal Cortical Volumes in Women With HIV

Even when HIV is well controlled, inflammation remains a problem, affecting the brain. Certain proteins in the blood, like soluble CD14 and CD163, are linked to chronic inflammation and can predict brain abnormalities. In the study, higher levels of soluble CD14 were associated with smaller brain volumes in different regions for all participants. In women with HIV, higher levels of soluble CD163 were linked to smaller volumes in one part of the brain. Other inflammatory markers like C-reactive protein and IL-6 didn't show a connection to brain volume changes. Confirming these findings in a larger group is important for understanding how HIV affects the brain.

Kamkwala AR, Wang X, Maki PM, Williams DW, Valcour VG, Damron A, Tien PC, Weber KM, Cohen MH, Sundermann EE, Meyer VJ, Little DM, Xu Y, Rubin LH. Brief Report: Higher Peripheral Monocyte Activation Markers Are Associated With Smaller Frontal and Temporal Cortical Volumes in Women With HIV. J Acquir Immune Defic Syndr. 2020 May 1;84(1):54-59. doi: 10.1097/QAI.0000000000002283. PMID: 31914004; PMCID: PMC7388688.

Intake of high saturated fat foods predicts cognitive change in the Women's Interagency HIV Study (WIHS)

Diet is a risk factor that may influence how people with HIV think. Diet can also be changed to make thinking better. We looked at diet in relation to tests of thinking over time in over 1000 women with HIV (WWH) and women without HIV (WWOH). All women participate in the Women's Interagency HIV Study (WIHS). Diet was measured using a diet screener. Our diet screener has a list of 18 foods or food groups and was developed by the National Cancer Institute. The foods listed in the screener include fruits, vegetables, meats, grains, dairy, beverages, desserts and chips, sweet beverages, and spreads. WIHS participants complete tests of thinking and cognition every other year. Overall thinking and specific types of thinking are measured. Our results showed that diet was similar between WWH and WWOH. However, in WWH only, eating more processed meat, sweet beverages, whole milk, and fish was associated with worse thinking scores overall, and with specific types of thinking. Eating more vegetables was good for thinking and the brain. Our findings need to be thought about carefully, since the way we measured diet was very simple. We want to continue to look at this relationship over time, to see if there are associations with brain diseases, like Alzheimer's Disease and related dementias.

Warrior L, Gustafson D, Weber K, et al. Intake of high saturated fat foods predicts cognitive change in the Women's Interagency HIV Study (WIHS). Neurology. 2020. doi: 10.1212/WNL.94.15_supplement.4847

Sex Differences in Neurocognitive Function in Adults with HIV: Patterns, Predictors, and Mechanisms

We looked at studies comparing cognitive function between women and men living with HIV. We found that women with HIV may be at greater risk for cognitive impairment, especially in memory, processing speed, and motor function. Factors like cognitive reserve, mental health, substance use, and biological differences between men and women could contribute to this difference.

Rubin LH, Neigh GN, Sundermann EE, Xu Y, Scully EP, Maki PM. Sex Differences in Neurocognitive Function in Adults with HIV: Patterns, Predictors, and Mechanisms. Curr Psychiatry Rep. 2019;21(10):94. Published 2019 Sep 14. doi:10.1007/s11920-019-1089-x

Variability in C-reactive protein is associated with cognitive impairment in women living with and without HIV: a longitudinal study

Despite effective HIV treatments, cognitive impairment (CI) is still common in people with HIV. Previous studies mostly involved men and suggested that inflammation, driven by certain immune cells, might be linked to HIV-related CI. We looked into whether inflammation levels in the blood could predict CI in women with and without HIV. For both groups, lower levels of one marker (sTNFR1) and higher levels of another (IL-6) were linked to CI. Also, higher variability in two markers (CRP and MMP-9) was associated with CI. In HIV+ women, higher variability in CRP predicted lower cognitive function in different areas, while in HIV- women, it was linked to worse learning ability. These findings suggest that changes in CRP levels over time might be a good indicator of CI in women, particularly those from minority and lower socioeconomic backgrounds.

Rubin LH, Benning L, Keating SM, Norris PJ, Burke-Miller J, Savarese A, Kumanan KN, Awadalla S, Springer G, Anastos K, Young M, Milam J, Valcour VG, Weber KM, Maki PM. Variability in C-reactive protein is associated with cognitive impairment in women living with and without HIV: a longitudinal study. J Neurovirol. 2018 Feb;24(1):41-51. doi: 10.1007/s13365-017-0590-4. Epub 2017 Oct 23. PMID: 29063513; PMCID: PMC6036635.

Cognitive trajectories over 4 years among HIV-infected women with optimal viral suppression

We wanted to see if keeping HIV levels low with medication changes how cognitive abilities change over time in HIV-positive (HIV+) women. Our findings show that even with low HIV levels, cognitive problems persist in HIV+ women. In some cases, women with consistently low HIV levels had more cognitive difficulties than those with inconsistent levels, suggesting a need for new treatments to address these issues.

Rubin LH, Maki PM, Springer G, Benning L, Anastos K, Gustafson D, Villacres MC, Jiang X, Adimora AA, Waldrop-Valverde D, Vance DE, Bolivar H, Alden C, Martin EM, Valcour VG; Women's Interagency HIV Study. Cognitive trajectories over 4 years among HIV-infected women with optimal viral suppression. Neurology. 2017 Oct 10;89(15):1594-1603. doi: 10.1212/WNL.0000000000004491. Epub 2017 Sep 13. PMID: 28904086; PMCID: PMC5634661.

Perceived and post-traumatic stress are associated with decreased learning, memory, and fluency in HIV-infected women

We investigated how psychological risk factors (PRFs) affect learning and memory in HIV-positive (HIV+) women over time. We found that HIV+ and HIV- women had similar levels of PRFs. The only domain where performance over time was influenced by both HIV status

and stress or PTSD was fluency. In HIV-positive women, higher stress and PTSD were linked to greater cognitive decline in fluency. Learning and memory performance, regardless of time, depended on the combined influence of HIV status and stress or PTSD, with negative effects observed particularly in HIV+ women without effective treatment or viral suppression. Regardless of time or HIV status, all PRFs were associated with lower speed, global NP, and executive function. Therefore, perceived stress and PTSD symptoms, more than depression, are important targets for intervention to potentially enhance fluency, learning, and memory in women living with HIV, especially when HIV treatment is suboptimal.

Rubin LH, Cook JA, Springer G, Weber KM, Cohen MH, Martin EM, Valcour VG, Benning L, Alden C, Milam J, Anastos K, Young MA, Gustafson DR, Sundermann EE, Maki PM. Perceived and post-traumatic stress are associated with decreased learning, memory, and fluency in HIV-infected women. AIDS. 2017 Nov;31(17):2393-1401. doi: 10.1097/QAD.0000000000001625. Epub 2017 Aug 28. PMID: 28857823; PMCID: PMC5831482.

Monocyte Activation Is Associated With Worse Cognitive Performance in HIV-Infected Women With Virologic Suppression

Cognitive problems persist even when HIV levels are low. We studied HIV-infected and uninfected women to understand why. We found that higher levels of certain immune markers were linked to worse cognitive function in both groups. One marker, sCD163, was linked to overall performance and various cognitive abilities like memory and motor skills. Another marker, sCD14, was linked to learning, memory, and other cognitive skills. Even in women with low HIV levels, sCD163 was still linked to cognitive problems. Other markers like CRP and IL-6 were not linked to cognitive issues. These findings suggest that ongoing immune activation, especially related to certain types of immune cells, may contribute to cognitive problems even when HIV levels are low.

Imp BM, Rubin LH, Tien PC, Plankey MW, Golub ET, French AL, Valcour VG. Monocyte Activation Is Associated With Worse Cognitive Performance in HIV-Infected Women With Virologic Suppression. J Infect Dis. 2017 Jan 1;215(1):114-121. doi: 10.1093/infdis/jiw506. Epub 2016 Oct 26. PMID: 27789726; PMCID: PMC5225255.

Elevated stress is associated with prefrontal cortex dysfunction during a verbal memory task in women with HIV

HIV-infected women may have trouble with verbal learning and memory, partly due to high stress levels. We looked at 36 HIV-infected women from the Women's Interagency HIV Study in Chicago to understand how stress affects the brain during memory tasks. Women with higher stress performed worse on memory tasks compared to those with lower stress. Brain scans showed that women with higher stress had different brain activity patterns during memory tasks, especially in the medial prefrontal cortex (PFC). This altered brain activity might make memory retrieval less efficient, leading to memory problems.

Rubin LH, Wu M, Sundermann EE, Meyer VJ, Smith R, Weber KM, Cohen MH, Little DM, Maki PM. Elevated stress is associated with prefrontal cortex dysfunction during a verbal memory task in women with HIV. J Neurovirol. 2016 Dec;22(6):840-851. doi: 10.1007/s13365-016-0446-3. Epub 2016 Apr 19. PMID: 27094924; PMCID: PMC5071112.

Prefrontal cortical volume loss is associated with stress-related deficits in verbal learning and memory in HIV-infected women

Memory problems are common in HIV-positive women and are related to high stress levels. We wanted to see how stress affects memory and the brain in these women. We studied 38 HIV-positive women, around 43 years old, in Chicago. We did brain scans and memory and stress tests. We focused on two brain areas, the medial temporal lobe and prefrontal cortex. Women with higher stress levels did worse on memory tests and had smaller brain volumes in certain areas. Women with lower stress levels did not show these differences. Smaller brain volumes in the prefrontal cortex were linked to poorer memory. Though we're not sure how long this decrease in volume lasts, the difference in brain size between women with higher and lower stress suggests it could be long-lasting.

Rubin LH, Meyer VJ, J Conant R, Sundermann EE, Wu M, Weber KM, Cohen MH, Little DM, Maki PM. Prefrontal cortical volume loss is associated with stress-related deficits in verbal learning and memory in HIV-infected women. Neurobiol Dis. 2016 Aug;92(Pt B):166-74. doi: 10.1016/j.nbd.2015.09.010. Epub 2015 Sep 25. PMID: 26408051; PMCID: PMC4808495.

Post-traumatic stress is associated with verbal learning, memory, and psychomotor speed in HIV-infected and HIV-uninfected women

In this study, we looked at how HIV infection and PTSD affect memory in women. We assessed 1,004 HIV-positive and 496 HIV-negative women. We found that HIV infection wasn't linked to PTSD, but it was linked to poorer memory and learning scores. Regardless of HIV status, women with PTSD had worse performance in memory and learning. Those who experienced sexual abuse and/or violence had more cognitive issues linked to PTSD.

Among women with PTSD, HIV-negative women performed worse in fine motor skills compared to HIV-positive women. These results highlight the importance of considering mental health factors in understanding cognitive problems in women with HIV.

Rubin LH, Pyra M, Cook JA, Weber KM, Cohen MH, Martin E, Valcour V, Milam J, Anastos K, Young MA, Alden C, Gustafson DR, Maki PM. Post-traumatic stress is associated with verbal learning, memory, and psychomotor speed in HIV-infected and HIV-uninfected women. J Neurovirol. 2016 Apr;22(2):159-69. doi: 10.1007/s13365-015-0380-9. Epub 2015 Sep 24. PMID: 26404435; PMCID: PMC4783199.

Human immunodeficiency virus (HIV) modulates the associations between insulin resistance and cognition in the current combination antiretroviral therapy (cART) era: a study of the Women's Interagency HIV Study (WIHS)

We looked at how insulin resistance (IR) relates to cognitive impairment (CI) in both HIV-infected and HIV-uninfected women, comparing them to see if there were any differences. We found that IR was linked to CI in some tests, and there was an interaction between HIV status and IR, showing a more complex relationship between these factors.

Valcour V, Rubin LH, Tien P, Anastos K, Young M, Mack W, Cohen M, Golub ET, Crystal H, Maki PM. Human immunodeficiency virus (HIV) modulates the associations between insulin resistance and cognition in the current combination antiretroviral therapy (cART) era: a study of the Women's Interagency HIV Study (WIHS). J Neurovirol. 2015 Aug;21(4):415-21. doi: 10.1007/s13365-015-0330-6. Epub 2015 Mar 5. PMID: 25740539; PMCID: PMC4511712.

Cognitive function in women with HIV: findings from the Women's Interagency HIV Study

In the biggest study of brain function in HIV-positive women, we looked at how HIV status relates to thinking abilities and other factors influencing cognition. We found that HIV's impact on thinking skills in women is minor, except for those with low reading skills or other health issues related to HIV. To understand if there are differences between men and women, we need to directly compare similar groups of HIV-positive men and women.

Maki PM, Rubin LH, Valcour V, Martin E, Crystal H, Young M, Weber KM, Manly J, Richardson J, Alden C, Anastos K. Cognitive function in women with HIV: findings from the Women's Interagency HIV Study. Neurology. 2015 Jan 20;84(3):231-40. doi: 10.1212/WNL.0000000000001151. Epub 2014 Dec 24. PMID: 25540304; PMCID: PMC4335997.

Atypical autonomic regulation, auditory processing, and affect recognition in women with HIV

This study explored how HIV affects certain bodily and mental functions related to social interaction. These functions are controlled by the Polyvagal Theory, which connects the regulation of heart activity with the control of facial and head muscles by the brainstem. The study found that HIV-positive women had lower heart rate variability and performed worse on tasks involving the processing of sounds and recognition of emotions than at-risk HIV-negative women. Additionally, the accuracy of identifying specific emotions was found to be negatively related to CD4 levels. These differences in autonomic and behavioral regulation may make it harder for HIV-infected women to interact socially and communicate with other people in their social circle.

Heilman KJ, Harden ER, Weber KM, Cohen M, Porges SW. Atypical autonomic regulation, auditory processing, and affect recognition in women with HIV. Biol Psychol. 2013;94(1):143-151. doi:10.1016/j.biopsycho.2013.06.003

Oral Health

Association between BMI and periodontitis in women living with or at risk for HIV

Gum disease is an infection of tissues that hold teeth in place. If not treated in time, gum disease can have harmful effects on how HIV infection advances. Obese people are thought to have more Gum disease in general population. We wanted to find out if this is true for someone who has HIV infection. We found that gum infection was present in majority of women, but we were happy to find out that obese women with or without HIV infection did not have more gum infection compared to non-obese women.

Janorkar DA, Long DM, Weber KM, Sharma A, Lin GH, D'Souza G, Edmonds A, Kassaye S, Lahiri CD, Konkle-Parker D. Association between BMI and periodontitis in women living with or at risk for HIV. Spec Care Dentist. 2022 Sep;42(5):486-493. doi: 10.1111/scd.12711. Epub 2022 Mar 13. PMID: 35279851; PMCID: PMC9867927.

Vitamin D deficiency and periodontal clinical attachment loss in HIV-seropositive women: A secondary analysis conducted in the Women's Interagency HIV Study (WIHS)

This study looked at how low vitamin D levels in the blood relate to the severity of gum disease in HIV-positive women. The findings suggested that lower vitamin D levels were linked to more attachment loss in the teeth. Additionally, the study found a new connection between vitamin D and clinical attachment loss in HIV-positive women. However, more research is needed to confirm if these findings apply to all HIV-positive individuals and to understand the cause and effect of this relationship.

Dragonas P, Kaste LM, Nunn M, Gajendrareddy PK, Weber KM, Cohen M, Adeyemi OM, French AL, Sroussi HY. Vitamin D deficiency and periodontal clinical attachment loss in HIV-seropositive women: A secondary analysis conducted in the Women's Interagency HIV Study (WIHS). Oral Surg Oral Med Oral Pathol Oral Radiol. 2018 Jun;125(6):567-573. doi: 10.1016/j.oooo.2018.02.006. Epub 2018 Feb 19. PMID: 29550079; PMCID: PMC6002805.

Other Medical Conditions

Impacts of Medicaid Expansion on Health Insurance and Coverage Transitions among Women with or at Risk for HIV in the United States

As jobs and finances change, people can gain, lose, or switch health insurance. This can affect their health and access to care. Medicaid is a type of health insurance for low-income people. In states with Medicaid expansion, more people are eligible for Medicaid. Among US women, we examined if HIV status and Medicaid expansion in their states affected insurance and insurance changes. 3,341 women (67% Black) attended 43,329 WIHS visits at age

Edmonds A, Belenky N, Adedimeji AA, Cohen MH, Wingood G, Fischl MA, Golub ET, Johnson MO, Merenstein D, Milam J, Konkle-Parker D, Wilson TE, Adimora AA. Impacts of Medicaid Expansion on Health Insurance and Coverage Transitions among Women with or at Risk for HIV in the United States. Womens Health Issues. 2022 Sep-Oct;32(5):450-460. doi: 10.1016/j.whi.2022.03.003. Epub 2022 May 11. PMID: 35562308; PMCID: PMC9532344.

Prevalence and Predictors of Hospitalizations Among HIV-Infected and At-Risk HIV-Uninfected Women

We studied a group of HIV-positive and HIV-negative women to see what factors predicted their risk of being hospitalized. For HIV-positive women, factors like higher VACS Index score (which considers various health indicators), depression, smoking, history of abuse, diabetes, and being black increased the risk of hospitalization. Similarly, for HIV-negative women, higher VACS Index score, depression, diabetes, and being black predicted

hospitalization. These factors were important regardless of the VACS Index score. More research is needed to understand how other factors, like environment and psychological factors, affect women's health outcomes.

Hotton AL, Weber KM, Hershov RC, Anastos K, Bacchetti P, Golub ET, Gustafson D, Levine AM, Young M, Cohen MH. Prevalence and Predictors of Hospitalizations Among HIV-Infected and At-Risk HIV-Uninfected Women. J Acquir Immune Defic Syndr. 2017 Jun 1;75(2):e27-e35. doi: 10.1097/QAI.0000000000001278. PMID: 28002184; PMCID: PMC5429173.

The Association of Human Cytomegalovirus with Biomarkers of Inflammation and Immune Activation in HIV-1-Infected Women

This study examined how cytomegalovirus (CMV) affects immune activation in women. They divided the women into three groups: those with both HIV-1 and CMV, those with HIV-1 only, and those with neither virus. They found that women with both HIV-1 and CMV had higher levels of CMV IgG and certain serum biomarkers compared to those with only HIV-1 or neither virus. However, there wasn't a significant link between CMV IgG levels and women without either virus. Among HIV-1 positive women, there seemed to be a connection between levels of sCD14 and CMV IgG. This suggests that the interaction between the viruses may occur in monocytes, possibly leading to health issues beyond those related to AIDS.

Lurain NS, Hanson BA, Hotton AL, Weber KM, Cohen MH, Landay AL. The Association of Human Cytomegalovirus with Biomarkers of Inflammation and Immune Activation in HIV-1-Infected Women. AIDS Res Hum Retroviruses. 2016 Feb;32(2):134-43. doi: 10.1089/AID.2015.0169. Epub 2015 Oct 22. PMID: 26422187; PMCID: PMC4761818.

Investigating the effects of metabolic dysregulation on hair follicles: a comparison of HIV-infected women with and without central lipohypertrophy

We looked into how HIV affects hair health in women by studying a group from the Women's Interagency HIV Study. While we didn't find a connection between changes in scalp hair texture or inflammation and central lipohypertrophy (a type of fat redistribution), we did discover that central lipohypertrophy is linked to shorter eyelash length. This may be due to the impact of certain substances called prostaglandin E2 on eyelash follicles.

Mirmirani P, Maurer T, Cohen M, D'Souza G, Karim R, Plankey M, Robison E, Sharma A, Tien PC, Hessol NA. Investigating the effects of metabolic dysregulation on hair follicles: a comparison of HIV-infected women with and without central lipohypertrophy. Int J

Pregnancy and Other Gynecology

Prolonged Amenorrhea and Resumption of Menses in Women with HIV

This study aimed to compare why women living with HIV and similar women without HIV experience prolonged amenorrhea (no periods for at least a year). Of the 828 women with prolonged amenorrhea, about 38% saw their periods return while the rest didn't. WWH tended to stop menstruating at a younger age than WWoH. Medications, especially hormonal contraception and drugs like opiates, were common causes of reversible prolonged amenorrhea. WWH were less likely to have medication-related amenorrhea than WWoH. Younger age, obesity, and lower education were linked to unexplained prolonged amenorrhea. Interestingly, severe immunosuppression in WWH wasn't tied to prolonged amenorrhea. The study suggests that prolonged amenorrhea in WWH should be investigated rather than just assumed to be menopause.

Cejtin HE, Evans CT, Greenblatt R, Minkoff H, Weber KM, Wright R, Colie C, Golub E, Massad LS. Prolonged Amenorrhea and Resumption of Menses in Women with HIV. J Womens Health (Larchmt). 2018 Sep 14;27(12):1441–8. doi: 10.1089/jwh.2018.7046. Epub ahead of print. PMID: 30222490; PMCID: PMC6306666.

Impact of chronic sexual abuse and depression on inflammation and wound healing in the female reproductive tract of HIV-uninfected and HIV-infected women

Sexual violence is linked to a higher risk of HIV in women, causing physical and emotional harm. We studied 77 women in four groups based on their HIV status and experiences with sexual abuse and depression. We looked at certain substances in the genital area that can affect HIV risk. In women without HIV, those who experienced chronic sexual abuse had higher levels of certain substances related to inflammation and wound healing. Depression seemed to interact with abuse, affecting these substances differently. In HIV-positive women, chronic sexual abuse was linked to changes in other substances related to inflammation and wound healing. Depression also played a role here. However, we didn't find differences in HIV-fighting ability among the groups. Our findings show that sexual abuse and depression affect the body's responses differently depending on HIV status, potentially increasing HIV risk. Further research is needed to understand this better.

Ghosh M, Daniels J, Pyra M, Juzumaite M, Jais M, Murphy K, Taylor TN, Kassaye S, Benning L, Cohen M, Weber K. Impact of chronic sexual abuse and depression on inflammation and wound healing in the female reproductive tract of HIV-uninfected and HIV-infected women.

PLoS One. 2018 Jun 12;13(6):e0198412. doi: 10.1371/journal.pone.0198412. PMID: 29894487; PMCID: PMC5997353.

Smoking, HIV, and risk of pregnancy loss

Cigarette smoking during pregnancy poses risks of pregnancy loss, but its impact on HIV-positive women hasn't been studied much. We looked at how smoking affects pregnancy loss in both HIV-positive and HIV-negative women and estimated how quitting smoking could reduce this risk for HIV-positive women. We analyzed data from 1033 pregnancies among 659 women. Smoking had a bigger impact on pregnancy loss in HIV-positive women compared to HIV-negative women. We found that offering a realistic smoking cessation intervention to 36 women could prevent one pregnancy loss. These findings highlight the importance of promoting smoking cessation among HIV-positive women, especially those planning to get pregnant.

Westreich D, Cates J, Cohen M, Weber KM, Seidman D, Cropsey K, Wright R, Milam J, Young MA, Mehta CC, Gustafson DR, Golub ET, Fischl MA, Adimora AA. Smoking, HIV, and risk of pregnancy loss. AIDS. 2017 Feb 20;31(4):553-560. doi: 10.1097/QAD.0000000000001342. PMID: 27902507; PMCID: PMC5263172.

Sleep

Tryptophan-Kynurenine Metabolic Pathway and Daytime Dysfunction in Women with HIV

Many women living with HIV have trouble sleeping. Researchers found that low levels of two chemicals, 5-hydroxytryptophan and serotonin, were linked to greater daytime dysfunction in all women. For women with HIV, having high levels of another chemical, kynurenic acid, was linked to more daytime problems. This chemical was not linked to problems in women who didn't have HIV.

Shorer EF, Rubin LH, French AL, Weber KM, Daubert E, Yohannes T, Morack R, Clish C, Bullock K, Gustafson D, Sharma A, Rogando AC, Qi Q, Burgess HJ, Dastgheyb RM.

Tryptophan-kynurenine metabolic pathway and daytime dysfunction in women with HIV. J Neurovirol. 2024 Mar 12. doi: 10.1007/s13365-024-01195-x. Epub ahead of print. PMID: 38472641.

Association of Gut Microbiota With Objective Sleep Measures in Women With and Without Human Immunodeficiency Virus Infection: The IDOze Study

Poor sleep health is often overlooked, especially for people with HIV. The study aimed to learn more about the connection between gut bacteria and sleep. Researchers found that seventeen different groups of microorganisms are linked to sleep quality and timing. One of these groups, called *Butyricimonas*, seems to be especially important for maintaining healthy sleep continuity. However, *Butyricimonas* is less common in women with HIV.

Zhang Y, Lin CL, Weber KM, Xing J, Peters BA, Sollecito CC, Grassi E, Wiek F, Xue X, Seaberg EC, Gustafson D, Anastos K, Sharma A, Burgess HJ, Burk RD, Qi Q, French AL. Association of Gut Microbiota With Objective Sleep Measures in Women With and Without Human Immunodeficiency Virus Infection: The IDOze Study. J Infect Dis. 2023 Nov 11;228(10):1456-1466. doi: 10.1093/infdis/jjad371. PMID: 37650624; PMCID: PMC10640774.

Overnight urinary melatonin levels in women with and without HIV: An observational cohort study

The study aimed to look at the overnight concentration of urinary melatonin in people with HIV. Melatonin is a hormone that regulates sleep and has anti-inflammatory properties. Results showed that melatonin levels did not differ between women with and without HIV, but more than 40% of women had low melatonin levels. Higher body mass index (BMI) predicted lower levels of melatonin, which is associated with lower sleep efficiency. Supplemental melatonin could improve sleep in women with lower levels of melatonin.

Burgess HJ, Weber KM, Morack R, Yohannes T, Xing J, Xue X, Gustafson D, Sharma A, Daubert E, Rogando AC, French AL. Overnight urinary melatonin levels in women with and without HIV: An observational cohort study. Brain Behav. 2023 Oct;13(10):e3206. doi: 10.1002/brb3.3206. Epub 2023 Aug 7. PMID: 37548505; PMCID: PMC10570498.

The IDOze Study: The Link Between Sleep Disruption and Tryptophan-Kynurenine Pathway Activation in Women With Human Immunodeficiency Virus

People living with HIV suffer a greater rate of sleep disturbance than others. We looked at the tryptophan:kynurenine (T/K) pathway- a pathway that contains melatonin and is activated by HIV and some of the inflammatory consequences of HIV. We found that markers of T/K pathway activation were associated with more disrupted sleep (more time awake after going to bed and less efficient sleep overall). We don't know whether lack of

sleep causes inflammation or inflammation causes lack of sleep but we are going to try to understand that with further studies.

Rogando AC, Weber KM, Xing J, Xue X, Yohannes T, Morack R, Qi Q, Clish C, Bullock K, Gustafson D, Anastos K, Sharma A, Burgess HJ, French AL. The IDOze Study: The Link Between Sleep Disruption and Tryptophan-Kynurenine Pathway Activation in Women With Human Immunodeficiency Virus. J Infect Dis. 2022 Oct 17;226(8):1451-1460. doi: 10.1093/infdis/jiac287. PMID: 35801535; PMCID: PMC9989737.

Association of Poor Sleep With Depressive and Anxiety Symptoms by HIV Disease Status: Women's Interagency HIV Study

HIV infection can directly and indirectly lead to poor sleep quality. Disturbances in sleep have been associated with systemic inflammation and worsening of many medical and mental health problems including mood and anxiety disorders. Individuals living with HIV are also at higher risk for these same conditions that may cause poor sleep. We are trying to understand sleep quality and the extent that sleep disturbances occur in WIHS women and whether this is influenced by HIV and other factors. We examined the association between measures of sleep quality and mental health. We used an easy to administer but well validated self-report questionnaire called the Pittsburgh Sleep Quality Index or PSQI.

Daubert E, French AL, Burgess HJ, Sharma A, Gustafson D, Cribbs SK, Weiss DJ, Ramirez C, Konkle-Parker D, Kassaye S, Weber KM. Association of Poor Sleep With Depressive and Anxiety Symptoms by HIV Disease Status: Women's Interagency HIV Study. J Acquir Immune Defic Syndr. 2022 Feb 1;89(2):222-230. doi: 10.1097/QAI.0000000000002847. PMID: 34732681; PMCID: PMC8740603.

Positive affect and its association with viral control among women with HIV infection

Our study looked at how positive emotions affect the control of the HIV virus in women. We found that positive emotions can help control the virus when negative emotions are low. This finding supports previous research in the area and can guide future efforts to understand how emotions affect our health.

Wilson TE, Weedon J, Cohen MH, Golub ET, Milam J, Young MA, Adedimeji AA, Cohen J, Fredrickson BL. Positive affect and its association with viral control among women with HIV infection. Health Psychol. 2017 Jan;36(1):91-100. doi: 10.1037/hea0000382. Epub 2016 Sep 29. PMID: 27685456; PMCID: PMC5209281.

Mechanisms for the Negative Effects of Internalized HIV-Related Stigma on Antiretroviral Therapy Adherence in Women: The Mediating Roles of Social Isolation and Depression

Internalized HIV stigma can make it tough to stick to HIV treatment plans. Studies show it's linked to poor treatment adherence, especially among minority groups. Depression, loneliness, and lack of social support are also tied to stigma and not taking medication properly. This cycle repeats: stigma leads to less social support, more loneliness, and more depression, which then leads to worse adherence. Addressing mental health and relationships can help improve treatment adherence, especially for minority women.

Turan B, Smith W, Cohen MH, Wilson TE, Adimora AA, Merenstein D, Adedimeji A, Wentz EL, Foster AG, Metsch L, Tien PC, Weiser SD, Turan JM. Mechanisms for the Negative Effects of Internalized HIV-Related Stigma on Antiretroviral Therapy Adherence in Women: The Mediating Roles of Social Isolation and Depression. J Acquir Immune Defic Syndr. 2016 Jun 1;72(2):198-205. doi: 10.1097/QAI.0000000000000948. PMID: 26885803; PMCID: PMC4868649.

Social, Behavioral, Substance Use

Intersectionality of Socioecological Factors Associated With Cognitive Function Among Older Women With HIV in the United States: A Structural Equation Model Analysis Using Data From the Women's Interagency HIV Study

People with HIV infection now live longer because of medications that work well. Living longer could affect patients' neurocognitive function (NCF) and quality of life. We had 448 older women living with HIV infection in the analysis. We found direct associations among mood, sexual abuse, race, age, and NCF. We also found an indirect association between substance use and NCF through mood. Patients' coping should be made stronger when faced with trauma, stigma, and other experiences to improve NCF. Interventions that are designed well would increase patients' overall NCF outcomes.

Rubin LH, O'Halloran JA, Williams DW, Li Y, Fitzgerald KC, Dastgheyb R, Damron AL, Maki PM, Spence AB, Sharma A, Gustafson DR, Milam J, Weber KM, Adimora AA, Ofotokun I, Fischl MA, Konkle-Parker D, Xu Y. Integrase Inhibitors are Associated with Neuropsychiatric Symptoms in Women with HIV. J Neuroimmune Pharmacol. 2023 Jun;18(1-2):1-8. doi: 10.1007/s11481-021-10042-3. Epub 2022 Feb 17. PMID: 35178611; PMCID: PMC9381649.

Predictors and Consequences of Prescription Opioid Use in Women Living With and Without HIV: 20-Year Follow-Up

The study aimed to determine prevalence and predictors of opioid use among a national cohort of women with and at risk for HIV enrolled during 2002-2016 and explore opioid-associated mortality. Over the 20-year study period, prescription opioid use prevalence doubled, while non-prescription opioid use decreased significantly among the 3819 women. Risk of death nearly doubled among prescription users during the study. Strategies to reduce harms related to prescription and non-prescription opioid use are needed as opioid use was associated with increased mortality in women in this cohort.

Cohen MH, Benning L, Weber KM, Sharma A, Plankey M, Kempf MC, Wilson TE, Aouizerat B, Milam J, Adimora AA, Wingood G, Carrico AW. Predictors and Consequences of Prescription Opioid Use in Women Living With and Without HIV: 20-Year Follow-Up. J Womens Health (Larchmt). 2022 Aug;31(8):1188-1196. doi: 10.1089/jwh.2021.0231. Epub 2022 Feb 28. PMID: 35230165; PMCID: PMC9419927.

Positive Psychological Factors and Life Themes in Relation to Health Outcomes in Women Living with HIV

Ten positive psychological factors (gratitude, insight, compassion, meaning-making, acceptance, mindfulness, generativity, optimism, self-reliance, and benevolent God beliefs) and three positive life themes (health improvements, positive relationships, and accomplishments) were identified in narratives. Higher accomplishments, overall positive factors, insight, mindfulness, self-reliance, optimism, meaning-making, and acceptance related to lower depressive symptoms (TOT, NA, SS, or IP). Positive factors and life themes did not significantly relate to PA. Higher compassion related to higher ART adherence. Higher accomplishments related to undetectable VL independent of ART adherence. Findings that positive psychological factors and life accomplishments may relate to better health, especially to lower depression, potentially contribute to developing positive psychology interventions for Black WLWH.

Brody LR, Firpo-Perretti Y, Bruck-Segal D, Dale SK, Ruffing EG, Cassiello-Robbins C, Weber KM, Cohen MH. Positive Psychological Factors and Life Themes in Relation to Health Outcomes in Women Living with HIV. Int J Behav Med. 2022 Aug;29(4):469-479. doi: 10.1007/s12529-021-10032-y. Epub 2021 Oct 28. PMID: 34713412; PMCID: PMC9046468.

Self-Reported Sexually Transmitted Infections After Incarceration in Women with or at Risk for HIV in the United States, 2007-2017

Many people over the age of 50 use drugs. Menopause symptoms, such as hot flashes, can make health worse. We were worried that using drugs may lead to more frequent menopause symptoms. We found that heavy alcohol use (more than 7 drinks per week) and narcotics use both led to worse menopause symptoms. We also found that women who previously smoked a pack a day or more had worse menopause symptoms. We think that if doctors assess people's previous and current drug use, it would lead to better treatment of menopause symptoms.

Knittel AK, Rudolph JE, Shook-Sa BE, Edmonds A, Ramirez C, Cohen M, Taylor T, Adedimeji A, Michel KG, Milam J, Cohen J, Donohue JD, Foster A, Fischl MA, Long DM, Adimora AA. Self-Reported Sexually Transmitted Infections After Incarceration in Women with or at Risk for HIV in the United States, 2007-2017. J Womens Health (Larchmt). 2022 Mar;31(3):382-390. doi: 10.1089/jwh.2021.0215. Epub 2021 Dec 30. PMID: 34967695; PMCID: PMC8972014.

Factors associated with syphilis seroprevalence in women with and at-risk for HIV infection in the Women's Interagency HIV Study (1994-2015)

Syphilis rates among women in the United States have more than doubled between 2014 and 2018. Researchers studied characteristics of syphilis among women enrolled in the United States Women's Interagency HIV Study (WIHS). Knowledge obtained from this study will help healthcare professionals to identify women that should be screened for syphilis. The study included women with HIV or at-risk of HIV who enrolled in WIHS between the years of 1994 and 2015. There were 3692 women from the early phase (years 1994-2002) and 1182 women from the recent phase (years 2011-2015) included in the study. Syphilis screening was performed at enrollment and infection was confirmed by two testing mechanisms. Characteristics at enrollment were compared for women by the presence of syphilis infection in each study phase. Researchers used statistical models to see which of these factors were most closely associated with syphilis infection. The prevalence of syphilis at enrollment was 7.5% in the early phase and 3.7% in the most recent phase. In the study's early phase, syphilis was related to HIV-infection, being of black race, having a low income, or trading sex for drugs, money, or shelter. In the study's recent phase, syphilis was linked to older age, problem alcohol use, and being infected with hepatitis C. Findings from the study's recent phase showed that there may be a benefit from regular syphilis screening among women with and at-risk for HIV who abuse drugs and alcohol.

Aaron KJ, Brill I, Causey-Pruitt Z, Murphy K, Augenbraun M, Kassaye S, Milam JE, Seidman D, French AL, Gange SJ, Adimora AA, Sheth AN, Fischl MA, Van Der Pol B, Marrazzo J, Kempf MC, Dionne-Odom J. Factors associated with syphilis seroprevalence in women with and

at-risk for HIV infection in the Women's Interagency HIV Study (1994-2015). Sex Transm Infect. 2022 Feb;98(1):4-10. doi: 10.1136/sextrans-2020-054674. Epub 2021 Jan 6. PMID: 33408096; PMCID: PMC9099234.

Intensity of Social Support Matters: A Latent Class Analysis to Identify Levels of Social Support Associated with Optimal Health Outcomes Among Women Living with HIV

Social support leads to better health in people living with HIV. It is assumed that having a lot of social support is as good as having some support. We show that having strong support leads to better taking of HIV medications. It also leads to having a lower viral load. Importantly, people with wavering levels of support do not do as well. As we consider how to give people living with HIV social support, we need to consider how to make sure that the support is strong enough to help them live happier and healthier lives.

Chandran A, Bhondoeckhan F, Wilson TE, Milam J, Cohen MH, Adimora AA, Adedimeji A, Cocohoba J, Parish C, Holstad M, Kassaye S, Kempf MC. Intensity of Social Support Matters: A Latent Class Analysis to Identify Levels of Social Support Associated with Optimal Health Outcomes Among Women Living with HIV. AIDS Behav. 2022 Jan;26(1):243-251. doi: 10.1007/s10461-021-03377-8. Epub 2021 Jul 21. PMID: 34287753; PMCID: PMC8776899.

Incidence and Prevalence of Incarceration in a Longitudinal Cohort of Women at Risk for Human Immunodeficiency Virus in the United States, 2007-2017

In this manuscript we develop, evaluate, and apply statistical methods for estimating causal effects when the outcome of interest is a count variable. Our methods take into account multiple issues that commonly arise when analyzing count data. We describe the statistical properties of the estimators we develop and evaluate them in a comprehensive simulation study. We then apply these methods to estimate the effects of incarceration on two count outcomes: (1) the number of sexual partners and (2) the number of cigarettes smoked following incarceration.

Knittel AK, Shook-Sa BE, Rudolph JE, Edmonds A, Ramirez C, Cohen MH, Adedimeji A, Taylor TN, Michel KG, Milam J, Cohen J, Donohue JD, Foster A, Fischl M, Konkle-Parker D, Adimora AA. Incidence and Prevalence of Incarceration in a Longitudinal Cohort of Women at Risk for Human Immunodeficiency Virus in the United States, 2007-2017. J Womens Health (Larchmt). 2021 May;30(5):694-704. doi: 10.1089/jwh.2020.8417. Epub 2021 Feb 5. PMID: 33544023; PMCID: PMC8112715.

Risk of smoking-related cancers among women and men living with and without HIV

We don't know whether the risk of smoking-related cancers is greater among women living with HIV compared to women without HIV. We also don't know whether the risk of these cancers is greater for women living with HIV compared to men with HIV. We found that HIV increased the risk of smoking-related cancers and that women had a great risk of these cancers compared to men. These results mean that we need more programs to help people living with HIV, especially women, quit smoking and stay quit to reduce their risk of smoking-related cancers.

Hessol NA, Barrett BW, Margolick JB, Plankey M, Hussain SK, Seaberg EC, Massad LS. Risk of smoking-related cancers among women and men living with and without HIV. AIDS. 2021 Jan 1;35(1):101-114. doi: 10.1097/QAD.0000000000002717. PMID: 33048871; PMCID: PMC7718307.

Food insecurity and neurocognitive function among women living with or at risk for HIV in the United States

Many women living with HIV experience ongoing problems with thinking and memory, known as neurocognitive impairment (NCI). Additionally, not having enough consistent access to food, called food insecurity, is common among women. This study aimed to see how food insecurity is linked to thinking skills in women, both with and without HIV. The findings showed that food insecurity was tied to poorer abilities in tasks involving planning and speed of thinking. For women with HIV, food insecurity was linked to better learning but worse motor skills. HIV status seemed to affect how food insecurity related to certain thinking abilities. These results suggest that ensuring stable access to food could be crucial for improving thinking skills in women, especially those facing economic challenges. More research is needed to understand exactly how food insecurity affects thinking skills in women living with or at risk for HIV.

Tan JY, A Sheira L, Frongillo EA, A Adimora A, Tien PC, Konkle-Parker D, Golub ET, Merenstein D, Levin S, Cohen M, Ofotokun I, A Fischl M, Rubin LH, Weiser SD. Food insecurity and neurocognitive function among women living with or at risk for HIV in the United States. Am J Clin Nutr. 2020 Nov 11;112(5):1280-1286. doi: 10.1093/ajcn/nqaa209. PMID: 32844175; PMCID: PMC7657325.

The Costs of Silencing the Self and Divided Self in the Context of Physical Abuse, Racial/Ethnic Identity, and Medication Adherence in Women Living with HIV

In the United States, women living with HIV (WLWH) who are racial/ethnic minorities or have a history of physical abuse face higher mortality rates and struggle with adhering to their antiretroviral therapy (ART). This study explored whether minority status and abuse history might cause these women to suppress their thoughts and feelings (known as "silencing the self"), which could affect their adherence to ART. The results showed that regardless of race or ethnicity, a history of physical abuse was linked to poorer adherence to ART. Silencing the self played a significant role in mediating the relationship between abuse history and adherence. Compared to white women, black women had worse adherence to ART but reported lower levels of silencing the self. Minority women and those with a history of abuse who experienced higher levels of silencing the self were more likely to struggle with adherence. These findings highlight the need for interventions to reduce health disparities among WLWH by addressing the impact of silencing the self on ART adherence.

Bruck-Segal D, Schwartz RM, Cohen MH, Weber KM, Burke-Miller JK, Kassaye S, Brody LR. The Costs of Silencing the Self and Divided Self in the Context of Physical Abuse, Racial/Ethnic Identity, and Medication Adherence in Women Living with HIV. Sex Roles. 2020 Jun;82(11-12):716-730. doi: 10.1007/s11199-019-01086-0. Epub 2019 Oct 5. PMID: 33311837; PMCID: PMC7731516.

Cross-validation of transtheoretical model smoking cessation measures in Chicago WIHS women smokers with and at risk for HIV

We studied smoking habits in women with or at risk for HIV, focusing on their readiness to quit using the Transtheoretical model (TTM). We found that most TTM measures for quitting smoking were reliable and valid, except for one. We observed differences in readiness to quit smoking based on certain TTM constructs, but not all. These findings suggest that TTM-based interventions could help women with or at risk for HIV quit smoking, but they should also address how they cope with negative feelings.

Redding CA, Goldberg D, Weber KM, Yin HQ, Paiva AL, Burke-Miller J, Cohen MH, Rossi JS. Cross-validation of transtheoretical model smoking cessation measures in Chicago WIHS women smokers with and at risk for HIV. Transl Behav Med. 2020 May 20;10(2):457-468. doi: 10.1093/tbm/ibz001. PMID: 30715533; PMCID: PMC7237546.

Association between Use of Methadone, Other Central Nervous System Depressants, and QTc Interval-Prolonging Medications and Risk of Mortality in a Large Cohort of Women Living with or at Risk for Human Immunodeficiency Virus Infection

The study aimed to see if using certain medications like methadone and others that affect the central nervous system increases the risk of death in women with or at risk for HIV. Researchers found that using benzodiazepines, other drugs affecting the central nervous system, and certain medications that can prolong QTc interval were linked to a higher risk of death in this group of women, regardless of whether they had HIV. This suggests that doctors need to be cautious when prescribing these medications to this vulnerable patient population.

Tamraz B, Reisner L, French AL, King ST, Fischl MA, Ofotokun I, Kashuba A, Milam J, Murphy K, Augenbraun M, Liu C, Finley PR, Aouizerat B, Cocohoba J, Gange S, Bacchetti P, Greenblatt RM. Association between Use of Methadone, Other Central Nervous System Depressants, and QTc Interval-Prolonging Medications and Risk of Mortality in a Large Cohort of Women Living with or at Risk for Human Immunodeficiency Virus Infection. Pharmacotherapy. 2019 Sep;39(9):899-911. doi: 10.1002/phar.2312. Epub 2019 Aug 13. PMID: 31332819; PMCID: PMC7000174.

History of Incarceration Among Women with HIV: Impact on Prognosis and Mortality

We wanted to find out what factors are linked to women being in prison and how being in prison affects their HIV-related health. We found that 38% of the women we studied had been in prison at some point. Women who had used drugs, were sexually minority, or had experienced physical or sexual abuse were more likely to have been in prison. Among the women with HIV who had been in prison, they were less likely to have their HIV under control and more likely to die compared to those who hadn't been in prison. This suggests that being in prison may worsen HIV outcomes for women. To help vulnerable women with HIV, it's important to address issues like substance use and incarceration by providing support and avoiding punishment.

Cohen MH, Weber KM, Lancki N, Gange SJ, Plankey M, Philbin MM, Milam J, Admora AA, Kempf MC, Holman S, Cohen J, Foster A, Sosanya O, Evans CT. History of Incarceration Among Women with HIV: Impact on Prognosis and Mortality. J Womens Health (Larchmt). 2019 Aug;28(8):1083-1093. doi: 10.1089/jwh.2018.7454. Epub 2019 May 17. PMID: 31099696; PMCID: PMC6709940.

Olive Oil Intake Associated with Increased Attention Scores in Women Living with HIV: Findings from the Chicago Women's Interagency HIV Study

We looked at how olive oil consumption relates to cognitive performance in women with and without HIV. In our study, 166 women, including 113 with HIV and 53 without HIV, completed cognitive tests and food questionnaires. We found that using olive oil was linked to better attention, verbal learning, and memory. Interestingly, the benefits of olive oil on attention were seen mainly in women with HIV, while the benefits on verbal learning and memory were mainly seen in women without HIV. This suggests that using olive oil as the main cooking oil may have different effects on cognitive abilities in women with and without HIV.

Warrior L, Weber KM, Daubert E, Morris MC, Agarwal P, Koranik JJ, French AL. Olive Oil Intake Associated with Increased Attention Scores in Women Living with HIV: Findings from the Chicago Women's Interagency HIV Study. Nutrients. 2019 Jul 31;11(8):1759. doi: 10.3390/nu11081759. PMID: 31370174; PMCID: PMC6723078.

Food insecurity and violence in a prospective cohort of women at risk for or living with HIV in the U.S

We looked at the connection between food insecurity and violence in women at risk for or living with HIV. Among 2,343 women, we found that those who experienced sexual, physical, or psychological violence were more likely to have very low food security. Women with very low food security at both the current and previous visit were more likely to experience violence. HIV status did not change these findings. This shows that food insecurity is strongly linked to violence, and women facing persistent food insecurity are even more likely to experience violence. Programs and policies addressing food insecurity need to consider the ongoing risk of violence for these women.

Conroy AA, Cohen MH, Frongillo EA, Tsai AC, Wilson TE, Wentz EL, Adimora AA, Merenstein D, Ofotokun I, Metsch L, Kempf MC, Adedimeji A, Turan JM, Tien PC, Weiser SD. Food insecurity and violence in a prospective cohort of women at risk for or living with HIV in the U.S. PLoS One. 2019 Mar 6;14(3):e0213365. doi: 10.1371/journal.pone.0213365. PMID: 30840700; PMCID: PMC6402690.

The Impact of Past and Current Alcohol Consumption Patterns on Progression of Carotid Intima-Media Thickness Among Women and Men Living with HIV Infection

The link between alcohol intake and atherosclerosis (hardening of the arteries) among people with HIV hasn't been thoroughly studied. To address this, we looked at data from

two groups: 1,164 women from the Women's Interagency HIV Study (WIHS) and 387 men from the Multicenter AIDS Cohort Study (MACS). None of them had a history of cardiovascular disease. Among women in the WIHS, heavy alcohol consumption in the past was linked to an increase in CCA-IMT over time compared to abstaining. Among men in the MACS, all past alcohol consumption patterns—low, moderate, and heavy—were associated with increased CCA-IMT over time compared to abstaining. Surprisingly, current heavy drinking was linked to a decrease in CCA-IMT in both WIHS and MACS participants. However, no significant differences were found when comparing changes in CCA-IMT over time between different alcohol consumption patterns. Overall, heavy alcohol consumption over a decade was associated with increased carotid artery thickness, especially among men. These findings suggest a potential risk window for heavy drinkers, both past and present. Further research is needed to determine if alcohol intake affects other measures of atherosclerosis. Screening for alcohol use and interventions to reduce heavy drinking may help people with HIV who are at risk of cardiovascular disease.

Chichetto NE, Plankey MW, Abraham AG, Sheps DS, Ennis N, Chen X, Weber KM, Shoptaw S, Kaplan RC, Post WS, Cook RL. The Impact of Past and Current Alcohol Consumption Patterns on Progression of Carotid Intima-Media Thickness Among Women and Men Living with HIV Infection. Alcohol Clin Exp Res. 2019 Apr;43(4):695-703. doi: 10.1111/acer.13974. Epub 2019 Feb 28. PMID: 30735256; PMCID: PMC6443465.

Prevalence, Comorbidity, and Correlates of Psychiatric and Substance Use Disorders and Associations with HIV Risk Behaviors in a Multisite Cohort of Women Living with HIV

We used a diagnostic interview from the World Health Organization to study the prevalence, co-occurrence, and factors related to lifetime and recent behavioral health issues among 1027 women with HIV in the United States. Most had experienced at least one behavioral health disorder in their lifetime, such as mood, anxiety, or substance use disorders. More than half had a recent disorder, with anxiety being the most common. On average, these behavioral health issues started nearly two decades before HIV diagnosis. Factors like race/ethnicity, employment, and income were linked to the likelihood of having these disorders. Women with recent behavioral health problems were more likely to engage in risky behaviors related to HIV transmission. This highlights the importance of addressing both physical and mental health needs in women living with HIV.

Cook JA, Burke-Miller JK, Steigman PJ, Schwartz RM, Hessol NA, Milam J, Merenstein DJ, Anastos K, Golub ET, Cohen MH. Prevalence, Comorbidity, and Correlates of Psychiatric and Substance Use Disorders and Associations with HIV Risk Behaviors in a Multisite Cohort of Women Living

with HIV. AIDS Behav. 2018 Oct;22(10):3141-3154. doi: 10.1007/s10461-018-2051-3. PMID: 29460130; PMCID: PMC6153984.

The effect of unstable housing on HIV treatment biomarkers: An instrumental variables approach

Unstable housing, such as homelessness, is a big concern, especially for those with serious health issues like HIV. We looked at how unstable housing affects HIV treatment by studying data from 3082 participants in the Women's Interagency HIV Study across various cities from 1995 to 2015. We used a measure called Housing Opportunities for People with AIDS (HOPWA) to see how housing assistance availability affects HIV treatment. Our findings show that unstable housing significantly reduces the chances of achieving viral suppression and having adequate CD4 cell counts. When we corrected for factors like endogeneity, the impact was even greater. This decrease in treatment success could be linked to factors like reduced access to mental healthcare, general healthcare, and less consistent treatment. Improving housing assistance programs like HOPWA and making housing more affordable for low-income and HIV-positive individuals could not only provide stable housing but also improve HIV-related health outcomes.

Galárraga O, Rana A, Rahman M, Cohen M, Adimora AA, Sosanya O, Holman S, Kassaye S, Milam J, Cohen J, Golub ET, Metsch LR, Kempf MC. The effect of unstable housing on HIV treatment biomarkers: An instrumental variables approach. Soc Sci Med. 2018 Oct;214:70-82. doi: 10.1016/j.socscimed.2018.07.051. Epub 2018 Aug 13. PMID: 30153546; PMCID: PMC6171130.

The effect of unstable housing on HIV treatment biomarkers: An instrumental variables approach

Unstable housing, like homelessness, is a big problem, especially for those with serious health issues like HIV. We studied how it affects HIV treatment by looking at data from over 3000 women with HIV in different cities from 1995 to 2015. We found that unstable housing makes it much harder to control the virus and keep the immune system strong. This effect is even bigger when we consider all factors. The reasons for this include less access to mental and general healthcare and less consistent care. To help, we should focus on making housing more stable and affordable, especially for low-income and HIV-positive people. This could not only provide a stable home but also improve their health.

Galárraga O, Rana A, Rahman M, Cohen M, Adimora AA, Sosanya O, Holman S, Kassaye S, Milam J, Cohen J, Golub ET, Metsch LR, Kempf MC. The effect of unstable housing on HIV

treatment biomarkers: An instrumental variables approach. Soc Sci Med. 2018 Oct;214:70-82. doi: 10.1016/j.socscimed.2018.07.051. Epub 2018 Aug 13. PMID: 30153546; PMCID: PMC6171130.

Past, present or future? Word tense and affect in autobiographical narratives of women with HIV in relation to health indicators

This study looked at how the words used to describe feelings and experiences in personal stories of 98 HIV+ women, mostly African American, affected their health outcomes. They measured undetectable HIV levels, CD4+ cell counts, and adherence to HIV medication at two different times. They found that using more past tense words was linked to worse HIV levels and cell counts initially, but using both past tense and positive words was linked to better cell counts later. Using future tense words was linked to better cell counts initially. Also, using present tense words and negative feelings was linked to better HIV levels initially. These findings suggest that how women express themselves can impact their health outcomes over time.

Firpo-Perretti YM, Cohen MH, Weber KM, Brody LR. Past, present or future? Word tense and affect in autobiographical narratives of women with HIV in relation to health indicators [published correction appears in J Behav Med. 2018 Jul 21. J Behav Med. 2018;41(6):875-889. doi:10.1007/s10865-018-9944-5

Measurement of Neighborhood Context in an Urban Cohort of HIV-infected or at risk Low-Income Women

The study of neighborhood disadvantage and health relies on census socioeconomic data but would benefit from reliable survey measures of factors that influence health within low income communities. The Perceptions of Neighborhood Environment Scale (PNES) was developed for use in the general U.S. population, and its measurement properties in a cohort of low-income urban women living with or at risk for HIV are described. The scale and all but one subscale have good psychometric and econometric reliability, as well as convergent, construct, and concurrent validity, and are not collinear with household and community area income in low-income urban neighborhoods.

Burke-Miller JK, Weber K, Cohn SE, Hershov RC, Sha B, French AL, Cohen MH. Measurement of Neighborhood Context in an Urban Cohort of HIV-infected or at risk Low-Income Women. J Poverty. 2017;21(1):80-96. doi: 10.1080/10875549.2016.1262933. Epub 2016 Dec 9. PMID: 29230088; PMCID: PMC5722238.

Neighborhood community characteristics associated with HIV disease outcomes in a cohort of urban women living with HIV

Recent research suggests that neighborhood poverty and segregation can impact immune and viral outcomes in HIV disease. However, traditional census measures may not fully capture how these factors affect health. This study compared census-based measures to survey-based measures of neighborhood disorder in 197 low-income women in a city. Both types of measures were related, but survey-based measures provided more varied insights. CD4 levels differed between community areas, but viral load did not. However, when considering individual factors like HIV treatment adherence, the link between community measures and viral load disappeared. In models adjusting for individual factors, neighborhood disadvantage based on census measures was associated with a higher likelihood of low CD4 levels.

Burke-Miller JK, Weber K, Cohn SE, Hershov RC, Sha BE, French AL, Cohen MH. Neighborhood community characteristics associated with HIV disease outcomes in a cohort of urban women living with HIV. AIDS Care. 2016 Oct;28(10):1274-9. doi: 10.1080/09540121.2016.1173642. Epub 2016 Apr 21. PMID: 27098593; PMCID: PMC5049499.

Abuse and resilience in relation to HAART medication adherence and HIV viral load among women with HIV in the United States

Abuse is common among HIV-positive women, which can lead to poor health outcomes, such as lower adherence to medication. Resilience, which means coping well despite adversity, can help counteract these negative effects. To examine the relationship between resilience and abuse history in relation to medication adherence, viral load, and CD4+ cell count, a study looked at a group of 138 HIV+ women from the Women's Interagency HIV Study. The study found that women with higher levels of resilience were more likely to have good adherence to medication and less likely to have a detectable viral load. However, the relationship between resilience and better HAART adherence was only observed among HIV+ women with sexual abuse or multiple abuses. Interventions to improve coping strategies that promote resilience among HIV+ women may be beneficial for achieving higher HAART adherence and viral suppression.

Dale S, Cohen M, Weber K, Cruise R, Kelso G, Brody L. Abuse and resilience in relation to HAART medication adherence and HIV viral load among women with HIV in the United States. AIDS Patient Care STDS. 2014;28(3):136-143. doi:10.1089/apc.2013.0329

Critical consciousness, racial and gender discrimination, and HIV disease markers in African American women with HIV

This study looks at how social oppression impacts HIV progression in African American women. Critical consciousness, which involves understanding social group identity, power distribution, system legitimacy, and collective action, can help buffer against HIV progression. The study found that higher critical consciousness was linked to better CD4+ counts and lower detectable viral loads in African American women with HIV who reported high racial discrimination. This underscores the importance of raising awareness about social oppression and promoting collective action to improve HIV outcomes in African American women facing gender and racial discrimination.

Kelso GA, Cohen MH, Weber KM, Dale SK, Cruise RC, Brody LR. Critical consciousness, racial and gender discrimination, and HIV disease markers in African American women with HIV. AIDS Behav. 2014;18(7):1237-1246. doi:10.1007/s10461-013-0621-y

Gender role behaviors of high affiliation and low self-silencing predict better adherence to antiretroviral therapy in women with HIV

We conducted a study to see how certain behaviors and qualities that support good relationships affect the health of women with HIV. We thought that women who showed more warmth and understanding towards others would stick better to their medication and have better health. We also thought that keeping quiet about their own needs and always putting others first might affect how helpful warmth and understanding were for their health. We found that women who kept quiet or always put others first didn't benefit as much from being warm and understanding towards others when it came to health. We found that women who showed more warmth and understanding were more likely to take their medication regularly and have higher CD4 counts. Also, women who didn't keep quiet about their feelings were more likely to have low HIV-1 viral load. But this wasn't true for women who kept quiet a lot. We also found that women who were less likely to keep quiet were more likely to stick to their medication. Keeping quiet can hurt communication skills needed for good relationships with doctors and partners, and can get in the way of self-care behaviors like sticking to treatment plans and keeping medical appointments. Other types of keeping quiet or hiding, like men who have sex with men and hide their sexual orientation, have also been linked to HIV viremia. Overall, our study suggests that having positive relationships and reducing keeping quiet about one's needs can help improve health for women with HIV.

Brody LR, Stokes LR, Kelso GA, Dale SK, Cruise RC, Weber KM, Burke-Miller JK, Cohen MH. Gender role behaviors of high affiliation and low self-silencing predict better adherence to

antiretroviral therapy in women with HIV. AIDS Patient Care STDS. 2014 Sep;28(9):459-61. doi: 10.1089/apc.2014.0068. Epub 2014 Jul 9. PMID: 25007140; PMCID: PMC4135315.

Crack cocaine use impairs anterior cingulate and prefrontal cortex function in women with HIV infection

This study looked at how crack cocaine use affects verbal memory in HIV-infected women. Researchers examined brain activity during a memory task and compared three groups: current crack users, former users, and those who never used crack. Current users performed worse on memory tests. Brain scans showed lower activity in the anterior cingulate cortex during encoding for current and former users, and lower activity in the prefrontal cortex during recognition. This reduced brain activity was linked to poorer performance on memory tasks. These findings suggest that cocaine use may affect memory in HIV-infected women by changing brain function.

Meyer VJ, Little DM, Fitzgerald DA, Sundermann EE, Rubin LH, Martin EM, Weber KM, Cohen MH, Maki PM. Crack cocaine use impairs anterior cingulate and prefrontal cortex function in women with HIV infection. J Neurovirol. 2014 Aug;20(4):352-61. doi: 10.1007/s13365-014-0250-x. Epub 2014 Apr 24. PMID: 24760360; PMCID: PMC4090256.

Sexual minority status and violence among HIV infected and at-risk women

The study looked at how sexual minority status and experiences of violence are connected among women with or at risk for HIV. It found that bisexual women or those with both male and female partners were more likely to experience sexual abuse and physical violence compared to heterosexual women. Substance use and engaging in high-risk sexual behavior were significant factors linked to this violence, especially for bisexual women. Addressing sexual identity, behavior, substance use, and risky sexual practices in healthcare and support settings could help reduce violence among women affected by HIV.

Pyra M, Weber K, Wilson TE, Cohen J, Murchison L, Goparaju L, Cohen MH. Sexual minority status and violence among HIV infected and at-risk women. J Gen Intern Med. 2014 Aug;29(8):1131-8. doi: 10.1007/s11606-014-2832-y. Epub 2014 Apr 4. PMID: 24700180; PMCID: PMC4099466.

Smoking cessation and recidivism in the Women's Interagency Human Immunodeficiency Virus Study

Cigarette smoking is harmful and increases the risk of illness and death, especially for those with HIV. Researchers examined trends in smoking and factors related to quitting and relapse among participants in the Women's Interagency HIV Study. From 1995 to 2011, the percentage of women who smoked decreased from 57% to 39%. Among smokers, those with less education, who drank alcohol, had health insurance, or who had smoked for more than 10 years, self-reported poor health rating, and had hypertension took a longer time to quit smoking. Women who were pregnant in the past 6 months were found to quit smoking sooner. Lower household income, using crack/cocaine/heroin, CD4 cell count ≤ 200 , and highly active antiretroviral therapy (HAART) use were associated with longer time to cessation. Smoking relapse was predicted by marijuana use, enrollment in 1994-1996, and not living in one's own place. Among HIV-infected women, crack/cocaine/heroin use were associated with shorter time to relapse, while older age and HAART use were associated with longer time to relapse. Even though rates of cigarette smoking are falling, HIV-infected women who smoke need help to quit smoking and maintain their cessation.

Hessol NA, Weber KM, D'Souza G, Burton D, Young M, Milam J, Murchison L, Gandhi M, Cohen MH. Smoking cessation and recidivism in the Women's Interagency Human Immunodeficiency Virus Study. Am J Prev Med. 2014 Jul;47(1):53-69. doi: 10.1016/j.amepre.2014.02.010. Epub 2014 Apr 18. PMID: 24746376; PMCID: PMC4065848.

Psychosocial correlates of gender-based violence among HIV-infected and HIV-uninfected women in three US cities

This study looked at psychological factors related to gender-based violence (GBV) among 736 women with and at risk for HIV. They found that both HIV-infected and uninfected women had high rates of lifetime GBV (58%) and childhood sexual abuse (22.2%). HIV-infected women were more likely to feel hopeless and have lower consideration of future consequences compared to uninfected women. The main factors associated with GBV and childhood sexual abuse were current non-injection drug use and a history of injection drug use, even when other psychological factors were considered. Being born outside of the US decreased the likelihood of experiencing GBV and childhood sexual abuse. This suggests that addressing substance abuse and considering cultural factors may be important in interventions aimed at reducing GBV among women with HIV or at risk for HIV.

Schwartz RM, Weber KM, Schechter GE, Connors NC, Gousse Y, Young MA, Cohen MH. Psychosocial correlates of gender-based violence among HIV-infected and HIV-uninfected women in three US cities. AIDS Patient Care STDS. 2014 May;28(5):260-7. doi: 10.1089/apc.2013.0342. Epub 2014 Apr 11. PMID: 24724987; PMCID: PMC4011431.

Facilitators and barriers to discussing HIV prevention with adolescents: perspectives of HIV-infected parents

We studied how parents living with HIV talked to their uninfected children about HIV prevention. We interviewed parents who had children between the ages of 10 and 18 to find out what helped or hindered their ability to talk about HIV prevention. We also asked them to fill out a questionnaire about how often they talked to their children about HIV prevention, what they talked about, how confident they felt, and how important they thought it was to talk about these topics. 81% of parents said they talked to their children about HIV prevention sometimes or often. But some parents found it hard to have these conversations. 44% of parents said they would like some support. Parents who found it easy to talk to their children about HIV prevention used support, talked about the benefits of talking, and had a good relationship with their child. Parents who found it hard to talk about HIV prevention were afraid of negative consequences, didn't want to believe they were at risk, and didn't have a good role model to follow. Some parents believed that their HIV status made it harder to talk to their children about HIV prevention. Parents who didn't tell their children about their HIV status had fewer conversations about HIV prevention. How confident parents felt about talking to their children also affected how often they talked about HIV prevention. We learned that parents with HIV need help learning how to talk to their children about HIV prevention. They need support and training so that they can talk about HIV prevention more often and more easily. This is especially important for parents of teenagers.

Edwards LL, Reis JS, Weber KM. Facilitators and barriers to discussing HIV prevention with adolescents: perspectives of HIV-infected parents. Am J Public Health. 2013 Aug;103(8):1468-75. doi: 10.2105/AJPH.2012.301111. Epub 2013 Jun 13. PMID: 23763390; PMCID: PMC3908917.

Computational modeling reveals distinct effects of HIV and history of drug use on decision-making processes in women

In this study, we looked into how HIV and drug use affect decision-making in women. While both groups performed similarly in behavior, drug use history was linked to problems with learning/memory and reduced aversion to loss. On the other hand, HIV was only connected to reduced aversion to loss. These findings show that HIV and drug use impact different aspects of decision-making in women. This research suggests that various psychological processes may influence behavior in different clinical groups, leading to different functional outcomes.

Vassileva J, Ahn WY, Weber KM, Busemeyer JR, Stout JC, Gonzalez R, Cohen MH. Computational modeling reveals distinct effects of HIV and history of drug use on decision-making processes in women. *PLoS One*. 2013 Aug 7;8(8):e68962. doi: 10.1371/journal.pone.0068962. Erratum in: *PLoS One*. 2013;8(9). doi:10.1371/annotation/5a8e6fe0-623c-4d17-8781-9a0eadf67a43. PMID: 23950880; PMCID: PMC3737214.

Alcohol consumption trajectory patterns in adult women with HIV infection

Over ten years, researchers tracked the drinking habits of nearly 2,800 HIV-positive women. They identified five main drinking patterns: some continued heavy drinking, others reduced heavy drinking, some started drinking heavily, many kept to moderate drinking, and many remained non-drinkers. Women who experienced depression, used drugs like crack, cocaine, or marijuana, smoked, had hepatitis C virus, or drank heavily in the past were more likely to continue heavy drinking. This suggests that healthcare providers should focus on supporting these women, offering interventions to help with depression and substance use.

Cook RL, Zhu F, Belnap BH, Weber KM, Cole SR, Vlahov D, Cook JA, Hessol NA, Wilson TE, Plankey M, Howard AA, Sharp GB, Richardson JL, Cohen MH. Alcohol consumption trajectory patterns in adult women with HIV infection. *AIDS Behav*. 2013 Jun;17(5):1705-12. doi: 10.1007/s10461-012-0270-6. PMID: 22836592; PMCID: PMC3534826.

HIV and recent illicit drug use interact to affect verbal memory in women

This study examined how HIV infection and recent illicit drug use affect cognitive abilities such as verbal memory, processing speed, and executive function. The research was conducted on women who participated in the Women's Interagency HIV Study. The results showed that HIV-infected women who recently used illicit drugs had poorer verbal learning and memory skills compared to those who did not use drugs. This suggests that the combination of HIV and drug use may have a negative impact on the brain, which could affect how well people perform these cognitive tasks. However, the study found no significant interaction between HIV and drug use on processing speed or executive function.

Meyer VJ, Rubin LH, Martin E, Weber KM, Cohen MH, Golub ET, Valcour V, Young MA, Crystal H, Anastos K, Aouizerat BE, Milam J, Maki PM. HIV and recent illicit drug use interact to affect verbal memory in women. *J Acquir Immune Defic Syndr*. 2013 May 1;63(1):67-76. doi: 10.1097/QAI.0b013e318289565c. PMID: 23392462; PMCID: PMC3628722.

Study Methods

Testing domains of the healing experiences in all life stressors questionnaire in a cohort of HIV-infected and HIV-uninfected Chicago women

Researchers at the National Institutes of Health have created a new questionnaire called the HEALS, which aims to assess how people deal with spiritual and religious aspects while coping with serious or long-term illnesses. Unlike other measures that focus on religious behavior, the HEALS questionnaire looks at the deeper meaning of spirituality and religion in the healing process. It covers different aspects like spirituality, religion, and relationships. This study focuses on validating the spirituality and religion parts of the HEALS questionnaire by comparing them to the Ironson-Woods Spirituality and Religiousness Index (IWSR). The results show that the spirituality and religion sections of the HEALS questionnaire align well with the IWSR, suggesting that it could be a useful tool for clinicians and researchers to understand how spirituality and religion impact healing. Further validation could make the HEALS questionnaire a valuable resource in assessing spiritual aspects of healing.

Mistretta EG, Sloan D, BrintzenhofeSzoc K, Weber KM, Berger A. Testing domains of the healing experiences in all life stressors questionnaire in a cohort of HIV-infected and HIV-uninfected Chicago women. Psychol Res Behav Manag. 2017;10:201-208. Published 2017 Jul 4. doi:10.2147/PRBM.S129566

Gender-Related Risk Factors Improve Mortality Predictive Ability of VACS Index Among HIV-Infected Women

The Veterans Aging Cohort Study (VACS) index is a tool that can predict the likelihood of death in HIV-infected women who are receiving treatment. Our study found that adding certain information about women's behavior and characteristics can improve the accuracy of the VACS index. Specifically, we found that depression and transactional sex are important factors to consider. Addressing these issues could help improve the health of HIV-infected women and reduce the risk of death. By taking a broader approach to HIV prevention that includes addressing economic and psychosocial instability, we could make a significant impact on mortality rates.

Cohen MH, Hotton AL, Hershov RC, Levine A, Bacchetti P, Golub ET, Anastos K, Young M, Gustafson D, Weber KM. Gender-Related Risk Factors Improve Mortality Predictive Ability of VACS Index Among HIV-Infected Women. J Acquir Immune Defic Syndr. 2015 Dec

15;70(5):538-44. doi: 10.1097/QAI.0000000000000795. PMID: 26284531; PMCID:
PMC4644433.