

Medical Nutritional Therapy	Pg
Service Category Definition – Part A	1
FY 2020 Part A Performance Measures	5
HIV: What to Know About Supplements – Everyday Health March 2023	6
HIV Diet: What to Know About Nutrition and HIV – Healthline, April 2022	9
Nutrition Requirements and Nutrition Intervention for People Living with HIV/AIDS - Journal of Health and Allied Sciences, 05/30/24	15

FY 2025 Houston EMA/HSDA Ryan White Part A Service Definition Medical Nutritional Therapy (Last Review/Approval Date: November 2021)	
HRSA Service Category Title: RWGA Only	Medical Nutritional Therapy
Local Service Category Title:	Medical Nutritional Therapy and Nutritional Supplements
Budget Type: RWGA Only	Hybrid
Budget Requirements or Restrictions: RWGA Only	<p>Supplements: An individual client may not exceed \$1,000.00 in supplements annually without prior approval by RWGA.</p> <p>Nutritional Therapy: An individual nutritional education/counseling session lasting a minimum of 45 minutes. Provision of professional (licensed registered dietician) education/counseling concerning the therapeutic importance of foods and nutritional supplements that are beneficial to the wellness and improved health conditions of clients. Medically, it is expected that symptomatic or mildly symptomatic clients will be seen once every 12 weeks while clients with higher acuity will be seen once every 6 weeks.</p>
HRSA Service Category Definition (do <u>not</u> change or alter): RWGA Only	Medical nutrition therapy is provided by a licensed registered dietitian outside of a primary care visit and may include the provision of nutritional supplements.
Local Service Category Definition:	<p>Supplements: Up to a 90-day supply at any given time, per client, of approved nutritional supplements that are listed on the Houston EMA/HSDA Nutritional Supplement Formulary. Nutritional counseling must be provided for each disbursement of nutritional supplements.</p> <p>Nutritional Therapy: An individual nutritional education/counseling session lasting a minimum of 45 minutes. Provision of professional (licensed registered dietician) education/counseling concerning the therapeutic importance of foods and nutritional supplements that are beneficial to the wellness and improved health conditions of clients. Medically, it is expected that symptomatic or mildly symptomatic clients will be seen once every 12 weeks while clients with higher acuity will be seen once every 6 weeks. Services must be provided under written order from a state licensed medical provider (MD, DO or PA) with prescribing privileges and must be based on a written nutrition plan developed by a licensed registered dietician.</p>
Target Population (age, gender, geographic, race, ethnicity, etc.):	Persons living with HIV residing within the Houston Eligible Metropolitan Area (EMA) or HIV Service Delivery Area (HSDA).

Services to be Provided:	<p>Supplements: The provision of nutritional supplements to eligible clients with a written referral from a licensed physician or PA that specifies frequency, duration and amount and includes a written nutritional plan prepared by a licensed, registered dietitian. <i>Nutritional Supplement Disbursement Counseling</i> is a component of <i>Medical Nutritional Therapy</i>. <i>Nutritional Supplement Disbursement Counseling</i> is a component of the disbursement transaction and is defined as the provision of information by a licensed registered dietitian about therapeutic nutritional and/or supplemental foods that are beneficial to the wellness and increased health condition of clients provided in conjunction with the disbursement of supplements. Services may be provided either through educational or counseling sessions. Also included in this service are follow up sessions with clients' Primary Care provider regarding the effectiveness of the supplements. The number of sessions for each client shall be determined by a written assessment conducted by the Licensed Dietitian but may not exceed twelve (12) sessions per client per contract year.</p> <p>Medical Nutritional Therapy: Service must be provided under written order of a state licensed medical provider (MD, DO, PA) with prescribing privileges and must include a written plan developed by state licensed registered dietitian. Client must receive a full range of medical nutritional therapy services including, but not limited to, diet history and recall; estimation of nutrition intake; assessment of weight change; calculation of nutritional requirements related to specific medication regimes and disease status, meal preparation and selection suggestions; calorie counts; evaluation of clinically appropriate laboratory results; assessment of medication-nutrient interactions; and bio-impedance assessment. If patient evaluation indicates the need for interventions such as nutritional supplements, appetite stimulants, or treatment of underlying pathogens, the dietitian must share such findings with the patient's primary medical provider (MD, DO or PE) and provide recommendations. Clients needing additional nutritional resources will be referred to case management services as appropriate and/or local food banks.</p> <p>Provider must furnish information on this service category to at least the health care providers funded by Ryan White Parts A, B, C and D and TDSHS State Services.</p>
Service Unit Definition(s): RWGA Only	<p>Supplements: One (1) unit of service = a single visit wherein an eligible client receives allowable nutritional supplements (up to a 90 day supply) and nutritional counseling by a licensed dietitian as clinically indicated. A visit wherein the client receives counseling but no supplements is <u>not</u> a billable <u>disbursement transaction</u>.</p> <p>Medical Nutritional Therapy: An individual nutritional counseling</p>

	session lasting a minimum of 45 minutes.
Financial Eligibility:	Refer to the RWPC's approved <i>Financial Eligibility for Houston EMA Services</i> .
Client Eligibility:	<p>Nutritional Supplements: Person living with HIV and documentation that the client is actively enrolled in primary medical care.</p> <p>Medical Nutritional Therapy: Person with HIV and documentation that the client is actively enrolled in primary medical care.</p>
Agency Requirements:	None.
Staff Requirements:	The nutritional counseling services under this category must be provided by a licensed registered dietician. Dieticians must have a minimum of two (2) years experience providing nutritional assessment and counseling to PLWH.
Special Requirements: RWGA Only	<p>Must comply with Houston EMA/HSDA Part A/B Standards of Care, HHS treatment guidelines and applicable HRSA/HAB HIV Clinical Performance Measures.</p> <p>Must comply with the Houston EMA/HSDA approved Medical Nutritional Therapy Formulary.</p>

FY 2028 RWPC “How to Best Meet the Need” Decision Process

Step in Process: Council		Date: 06/18/2022)
Recommendations:	Approved: Y: _____ No: _____ Approved With Changes: _____	If approved with changes list changes below:
1.		
2.		
3.		
Step in Process: Steering Committee		Date: 06/01/2022)
Recommendations:	Approved: Y: _____ No: _____ Approved With Changes: _____	If approved with changes list changes below:
1.		
2.		
3.		
Step in Process: Quality Improvement Committee		Date: 05/11/2022)
Recommendations:	Approved: Y: _____ No: _____ Approved With Changes: _____	If approved with changes list changes below:
1.		
2.		
3.		
Step in Process: HTBMTN Workgroup #2		Date: 04/11/2022)
Recommendations:	Financial Eligibility:	
1.		
2.		
3.		

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FY 2020 PERFORMANCE MEASURES HIGHLIGHTS

RYAN WHITE GRANT ADMINISTRATION

HARRIS COUNTY PUBLIC HEALTH (HCPH)

Ryan White Part A
HIV Performance Measures
FY 2020 Report

Medical Nutritional Supplements

HIV Performance Measures	FY 2019	FY 2020	Change
80% of clients for whom there is lab data in the CPCDMS will be virally suppressed (<200)	376 (81.7%)	496 (83.4%)	1.7%
90% of clients diagnosed with wasting syndrome or suboptimal body mass will improve or maintain body mass index (BMI) in the measurement year	3 (50.0%)	5 (83.3%)	33.3%

HCPH is the local public health agency for the Harris County, Texas jurisdiction. It provides a wide variety of public health activities and services aimed at improving the health and well-being of the Harris County community.

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HIV: What to Know About Supplements

By Dennis Thompson Jr Medically Reviewed by Jane Yoon Scott, MD Reviewed: March 18, 2023



Dietary supplements are used by many people to ensure that they get enough daily nutrients — and when you're living with [human immunodeficiency virus](#) (HIV), supplements can play an important role in your therapy. That's because people with HIV are more likely to develop [deficiencies](#) in important micronutrients, and a lack of proper nutrition is known to speed the infection's progress. Getting the nutrients you need can provide a needed boost to your immune system and support you in your HIV treatment.

But supplements for HIV management come with a caveat: Doctors prefer that people undergoing HIV therapy get most of their nutrients from a healthy diet, not pills, says [Margaret Hoffman-Terry, MD](#), a specialist in infectious diseases and HIV care at the Lehigh Valley Health Network in Allentown, Pennsylvania.

However, because HIV/AIDS can lead to difficulty eating — whether due to decreased appetite or [gastrointestinal](#) symptoms of the virus — it is not always possible to get enough nutrients from food. Diarrhea and vomiting, which are common [symptoms of HIV](#) as well as side effects of some [HIV medications](#), can also lead to malabsorption, or the inability of the body to absorb needed nutrients from food. Further, some people may opt for quick options like fast food when they get busy, making it tough to get all the nutrients they need from diet alone.

“In our modern life, it can be difficult to find time to cook a good meal all the time,” Dr. Hoffman-Terry notes.

Dietary Supplements in HIV Therapy

In addition to eating as [well-balanced a diet](#) as possible, people undergoing HIV therapy can benefit from a daily [multivitamin](#). You can talk to a nutritionist about how to best accomplish this. He or she

can look at your diet and make recommendations on what to eat when you're experiencing HIV symptoms that prevent you from having regular meals. You can also discuss whether dietary supplements could help you meet your nutrition goals, and which ones would be most beneficial for you.

Dietary supplements beyond a daily multivitamin usually are not necessary in HIV therapy. "Although supplements are a big business, they aren't generally warranted when one looks at the evidence on how helpful they actually are," says [Joseph S. Cervia, MD](#), a certified HIV practitioner and clinical professor of medicine and pediatrics at the Donald and Barbara Zucker School of Medicine at Hofstra/Northwell in New York.

However, dietary supplements can prove useful for those who are deficient in certain nutrients due to malabsorption or gastrointestinal symptoms and lack of appetite. Just be sure to check with your HIV specialist or provider before using them, Dr. Cervia cautions, since supplements and herbal remedies can still cause side effects and interact with other medications you may be taking.

Dietary supplements that can assist in HIV therapy include:

B-complex vitamins, which help boost the immune system and the nervous system

[Vitamin C](#), which helps the body fight infection and respond to illness

[Vitamin D](#), which can help protect aging HIV patients from [osteoporosis](#)

[Selenium](#) and zinc, which play important roles in the function of the immune system and are often lacking in people undergoing HIV treatment

Omega-3 fatty acids, which are found in [fish oil](#) dietary supplements and can decrease inflammation and support immunity

Dehydroepiandrosterone (DHEA), which is a hormone often low in people undergoing HIV therapy and which can help with minor depression

[Probiotic](#) dietary supplements and L-glutamine, which can support gastrointestinal health

Coenzyme Q10, which is a powerful antioxidant that could increase immune system function

Supplements to Avoid in HIV Therapy

Be cautious about starting any supplements beyond a daily multivitamin on your own, Hoffman-Terry and Cervia note, especially the following three:

St. John's Wort Some people take this herbal supplement as a [treatment for depression](#), but it can interfere with medications used in HIV therapy. "St. John's wort is processed by the same system in the liver that handles protease inhibitors and other HIV antivirals," Hoffman-Terry says. "It will

decrease your levels of those drugs.”

Fat-Soluble Vitamins The body excretes excess amounts of most water-soluble vitamins in urine, but fat-soluble vitamins like A, D, E, and K are stored in the body. “This may lead to toxic effects over time,” Cervia says.

Megavitamin Therapy Some people try to treat chronic illnesses by taking high doses of dietary supplements that far exceed recommended daily allowances. Cervia says those undergoing HIV therapy should not do this because huge doses of some vitamins can cause serious risks and side effects. For example, too much fat-soluble [vitamin A](#) can cause side effects like [jaundice](#), nausea, and vomiting.

In general, when you’re undergoing HIV therapy, be very cautious regarding any claims made about dietary supplements, particularly if the supplement seems like part of a fad.

“There are a lot of drugs out there that are sold to people as immune strengtheners, but they may not actually help,” Hoffman-Terry says. “Dietary supplements, such as vitamins, are not tested by the FDA or held to any particular standard. If you are curious about whether a supplement might be good for you, ask your doctor before taking it.” He or she may agree that supplementation with certain nutrients is worth a try under medical watch.

HIV Diet: What to Know About Nutrition and HIV

HIV treatment has come a long way, and people with HIV can live long and healthy lives if medication, including antiretroviral therapy (ART) medications, are accessible and taken as prescribed.

In addition to ART, many people with HIV are interested in natural ways to support their health, including diet and supplementation.

This article reviews the role of diet and supplementation in HIV-positive populations and gives recommendations for how to support overall health while living with HIV.

Nutrients, including protein, vitamins, and minerals, are necessary for the proper functioning of the body, including the immune system.

That's why it's important for all people, regardless of HIV status, to consume a varied diet that provides an array of nutrients.

A well-rounded diet can help support the health of the immune system and can reduce the risk of malnutrition.

[HIV-positive people](#) have higher needs for certain nutrients and are more likely to experience nutrient deficiencies than the general population. Plus, some nutrients are especially important for those with HIV, as they play an essential role in immunity and may help reduce side effects of ART ([3Trusted Source](#)).

People with HIV are at a higher risk for malnutrition

People with HIV are at higher risk for becoming malnourished compared with the general population: energy needs are around 10% higher in those with asymptomatic HIV and 20–30% higher in those with symptomatic HIV ([4Trusted Source](#)).

A 2019 study that included 812 HIV-positive people found that 11.45% of the participants were at some risk for malnutrition. The risk of malnutrition was higher in older adults and females. Hispanic participants also had a higher risk compared with Black and white participants ([4Trusted Source](#)).

That may mean that people with HIV — even those who are asymptomatic — have higher overall needs for calories and nutrients, including protein.

Although it's recognized that people with HIV have [higher protein](#) needs than people who don't have HIV, there are currently no guidelines for protein intake for people living with HIV.

According to older research, some experts recommend .45–.63 grams of protein per pound (1–1.4 g/kg) of bodyweight for HIV-positive people *maintaining* weight and muscle mass and .68–.9 grams per pound (1.5–2 g/kg) for HIV-positive people *gaining weight* and muscle mass ([5Trusted Source](#)).

Other studies have shown that nutritional supplements containing high amounts of protein can help people with HIV gain muscle mass and bodyweight ([6Trusted Source](#), [7Trusted Source](#)).

Plus, older research suggests that protein supplements may help improve immune function by increasing levels of certain blood cells that help fight infections, including CD4 lymphocytes ([6Trusted Source](#), [8Trusted Source](#)).

HIV attacks and destroys CD4 cells, which is why we use [CD4 counts](#) to assess the health of HIV-positive folks.

People with HIV are at a higher risk of nutrient deficiencies

People with HIV are more likely to be deficient in certain nutrients compared with the general population.

That's likely due to immune dysfunction, higher nutrient needs, nutrient malabsorption, and ART-related side effects ([9Trusted Source](#), [10Trusted Source](#), [11Trusted Source](#), [12Trusted Source](#)).

Studies over time show that people with HIV are more likely to be deficient in many vitamins and minerals, including vitamin D, B12, folate, [selenium](#), vitamin E, B6, and more ([9Trusted Source](#), [10Trusted Source](#), [11Trusted Source](#), [12Trusted Source](#)).

For example, numerous studies have demonstrated that HIV-positive people are at a significant risk of being deficient in vitamin D, which can negatively impact immune function ([13Trusted Source](#)).

Plus, [vitamin D deficiency](#) in people with HIV has been associated with bone disease, depression, high blood pressure, and infections ([10Trusted Source](#)).

Fortunately, research suggests that supplementing with vitamin D can replenish vitamin D levels and help improve markers of immune function, including CD4 counts ([14Trusted Source](#)).

Supplementation with a multivitamin or single-nutrient supplements may be helpful for those with HIV, as they can help treat deficiencies and support people with HIV in maintaining optimal nutrient levels.

However, it's best for those with HIV to come up with a personalized supplement regimen with a team of healthcare professionals, since HIV-positive people have different nutrient needs depending on factors like diet, sex, age, and severity of disease.

If you have HIV, healthcare professionals can order bloodwork to assess levels of certain nutrients, such as vitamin D and B12, and make appropriate supplement recommendations based on your results.

Proper nutrition may help decrease ART-related side effects and improve treatment efficacy

A nutrient-dense diet may help reduce the risk of [HIV medication](#)-related side effects and improve treatment efficacy in people with HIV.

Some ARTs interfere with the body's ability to metabolize glucose (sugars) and fats as well as negatively affect bone health, which may lead to increased risk of heart disease, [type 2 diabetes](#), and decreased bone mineral density ([15Trusted Source](#), [16Trusted Source](#), [17Trusted Source](#)).

That is why it's important for people with HIV taking ARTs to follow a healthy, balanced diet and supplement with certain nutrients when appropriate.

A diet rich in protein, healthy fats, and fiber could help improve ART- and HIV-related side effects like insulin resistance and high blood fat levels ([17Trusted Source](#), [18Trusted Source](#)).

For example, a balanced, high fiber, low [glycemic index](#) diet may help reduce blood fat levels and support healthy insulin and blood sugar regulation ([19Trusted Source](#)).

What's more, supplementation with nutrients like vitamin D can help reduce ART-related complications like decreased bone mineral density ([16Trusted Source](#)).

Summary

People living with HIV have higher energy needs and face higher risks of developing nutrient deficiencies compared with the general population. ART can also lead to side effects like decreased bone mineral density and high blood lipid levels.

Energy (caloric) needs are around 10% higher in those with asymptomatic HIV and 20–30% higher in those with symptomatic HIV ([4Trusted Source](#)).

These increased energy needs can [make it harder for those with HIV to gain and maintain bodyweight](#) and muscle mass.

Notably, one study found that the risk of malnutrition was significantly higher in specific groups of people with HIV, including older adults, females, and Hispanic people ([4Trusted Source](#)).

What's more, for HIV-positive people experiencing food insecurity, the risk of [malnutrition](#) is even higher, according to older research studies ([20Trusted Source](#), [21Trusted Source](#), [22Trusted Source](#)).

Malnutrition is associated with poor physical and mental health and poorer clinical outcomes in people with HIV ([22Trusted Source](#)).

Because HIV increases overall energy needs, it's important for those living with this condition to follow a balanced diet, including regular meals and snacks, in order to prevent weight loss.

That's essential for all HIV-positive people, regardless of whether they're [experiencing symptoms](#).

Although there's no set protein intake guidelines for people with HIV, a higher protein diet appears to help promote muscle mass gain and maintenance ([23Trusted Source](#)).

Adding a source of protein to all meals and snacks can help ensure that you're meeting daily protein needs. Examples of protein sources include chicken, fish, eggs, and beans.

Incorporating a [protein powder supplement](#) into the diet can also help people with HIV increase their daily protein needs.

Making a smoothie or protein shake with other nutrient-dense ingredients like nut butter, Greek yogurt, and berries can be a simple way to improve overall diet quality.

It's important to note that people with HIV have varying nutrient needs, so there's no one-size-fits-all diet when it comes to promoting overall health and supporting a healthy body weight.

Whenever possible, it's helpful to get personalized advice from a medical professional like a [registered dietitian](#).

Summary

People with HIV have higher nutrient needs, which increases the risk of weight loss and malnutrition. Eating regular, balanced meals and snacks can help support a healthy body weight and cover nutritional needs.

It's clear that eating a nutritious diet high in vitamins, minerals, fiber, healthy fats, and protein is important for people living with HIV. Following a healthy diet can help support healthy body weight maintenance, immune health, mental health, and more.

However, there's currently no specific dietary pattern recommended for all HIV-positive people.

Yet, because HIV compromises the immune system, food safety is important for those living with this condition ([24](#)).

: **cod safety**

People living with HIV face greater risks of developing foodborne illnesses ([food poisoning](#)), so certain precautions should be taken in order to minimize those risks.

The United States Department of Health and Human Services recommends that HIV-positive folks avoid foods likely to cause foodborne illness, including raw eggs, raw meat, [unpasteurized dairy](#), and raw seafood. It's also advised to wash fruits and vegetables thoroughly before eating ([25](#)).

Ways to help protect against foodborne illness include ([25](#), [26](#)):

- using a separate cutting board when preparing meat
- cooking foods like meat thoroughly
- refrigerating perishable foods within two hours of cooking or purchasing
- washing hands and utensils thoroughly after food preparation
- paying special attention to the quality of water you drink

Nutrient-dense dietary patterns to consider

In addition to minimizing foodborne illness risks, it's recommended that folks with HIV follow a diet high in nutritious foods that provide an array of nutrients, including vegetables, fruits, protein-rich foods like fish, and healthy fats like avocados, [olive oil](#), nuts, and seeds.

Following a balanced diet can help minimize the risk of nutrient deficiencies and make sure your body gets sufficient amounts of protein, vitamins, minerals, and other important nutrients needed for immune function, muscle mass maintenance, and more.

It should be noted that [some HIV-positive people experience diarrhea](#) and other symptoms due to ART side effects, pathogens, and HIV-related intestinal damage.

Your healthcare team can prescribe medication to help reduce these symptoms and may recommend a special diet to help treat the diarrhea, whether it's chronic or short-term.

Staying hydrated by drinking plenty of fluids is essential for everyone, including those with HIV. It becomes even more important if you're also experiencing prolonged diarrhea, as it can lead to [dehydration](#) and other complications ([27Trusted Source](#)).

If you're experiencing diarrhea or other gastrointestinal symptoms, it's important to visit a healthcare professional so you can get appropriate treatment.

Lastly, people with HIV are at greater risk of developing certain health conditions. In fact, your risk of developing type 2 diabetes may be 4 times greater if you have HIV ([17Trusted Source](#)).

People with HIV are also more likely to [develop heart disease](#) ([28Trusted Source](#)).

Following a nutritious diet high in fiber, protein, and healthy fats may help reduce the risk of HIV-related health complications by improving blood sugar regulation, reducing blood lipid levels, and maintaining a healthy bodyweight.

What about supplements?

Every person with HIV has different needs and may benefit from different supplement regimens based on factors like dietary intake, nutrient deficiencies, and disease severity.

Some evidence suggests that [some dietary supplements](#) may be helpful for improving certain aspects of health in people living with HIV.

For example, one review of nine studies found that omega-3 supplements significantly reduced triglyceride levels and increased heart-protective high density lipoprotein (HDL) cholesterol in HIV-positive people ([29Trusted Source](#)).

A 2019 review that included 6 studies found some evidence that supplementation with 200 mcg of selenium per day over 9–24 months may help delay the decline of CD4 counts in people with HIV ([30Trusted Source](#)).

Vitamin D supplementation can help increase vitamin D levels in the body and has also been shown to reduce inflammation, protect bone health, and improve CD4 levels ([31Trusted Source](#)).

Supplementing with zinc, B12, [folate](#), calcium, and other nutrients may also be helpful for those with HIV ([32Trusted Source](#), [33Trusted Source](#), [34Trusted Source](#)).

However, everyone living with HIV has different needs, so it's important to develop a personalized supplement regimen with healthcare professionals. They can help you choose supplements that may be most helpful for you and can also recommend appropriate dosing.

It's important for those with HIV to discuss all supplements with their healthcare team. Some dietary supplements, including herbs like [St. John's Wort](#) and nutrients like vitamin C and some forms of calcium, can significantly reduce the effects of some ARTs ([35Trusted Source](#)).

Summary

Even though there's currently no specific diet recommended for HIV-positive folks, a nutrient-dense diet high in healthy foods can help support overall health. Food safety is essential for reducing the risk of foodborne illness. Some supplements may be helpful, while others can interfere with ARTs.



Nutrition Requirements and Nutrition Intervention for People Living with HIV/AIDS (Adults)

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J Health Allied Sci^{NU}

Abstract

Nutrition plays a crucial role in the overall health and well-being of people living with human immunodeficiency virus (HIV). This review aims to provide a current summary of the macronutrient and micronutrient requirements for HIV-positive individuals. The author emphasizes the fundamentals of nutrition treatment as a guide for medical professionals to adopt the right strategy based on risk-adapted nutrition therapy. The majority of nutrition guidelines were published over 10 years ago and have failed to address the protein requirements for people with human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS). Proper nutrition can reduce the risk of malnutrition, infections, and other complications, while also assisting with symptom management, maintaining a healthy weight, and improving immune function. In this review, the author has identified the latest reliable and validated nutrition screening tool specifically designed for people with HIV/AIDS, along with a risk-stratified nutrition therapy based on the screening tool to facilitate the nutrition care process. People living with HIV/AIDS have unique nutritional needs due to the virus's impact on the body's immune system, metabolism, and nutrient absorption. It is important for them to work with a healthcare professional, namely a dietitian, to assess nutrition risk and develop an individualized dietary intervention for a healthy lifestyle.

Keywords

- HIV
- AIDS
- nutrition
- dietary guidelines

Introduction

The global prevalence of human immunodeficiency virus (HIV) remains a significant public health concern. According to the Joint United Nations Program on HIV/AIDS, as of 2021, approximately 38.4 million people were living with HIV worldwide.¹ However, the prevalence of HIV is considerably higher in other regions, notably Sub-Saharan Africa, Eastern Europe, and Central Asia. Among these regions, Sub-Saharan Africa bears the greatest burden of HIV, accounting for 70% of

global HIV infections in 2021.¹ It is essential to recognize that HIV prevalence is not uniform worldwide. Therefore, addressing this uneven distribution of HIV infections and ensuring access to adequate nutrition, treatment, and healthcare services in high-prevalence areas remains a paramount priority in the ongoing battle against the HIV/AIDS pandemic.

As HIV weakens the body's defenses, individuals are not only more susceptible to infections but also face challenges in maintaining proper nutrition.² HIV is the causative agent

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of acquired immunodeficiency syndrome (AIDS), which damages immune cells and hinders their ability to function effectively.² The virus can disrupt the normal absorption of nutrients in the gastrointestinal tract and increase energy expenditure, leading to weight loss and malnutrition.³ As HIV progresses to AIDS and progressively weakens the host's defense mechanisms, infected individuals can develop severe illnesses, including malnutrition, tuberculosis, encephalopathy, severe bacterial infections, and cancers such as lymphomas and Kaposi's sarcoma.^{2,4} This interplay between HIV pathology and malnutrition can create a vicious cycle, with each exacerbating the other. Therefore, addressing the nutritional needs of individuals living with the virus is essential for enhancing their overall health and quality of life.

The consumption of a well-balanced and healthy diet is essential for the health and survival of all individuals, regardless of their HIV status. A recent retrospective cohort study has revealed that malnutrition significantly accelerates the onset of infections in people living with HIV, but this can be ameliorated through appropriate nutritional interventions.⁵ In fact, deficiencies in certain micronutrients such as iron, folic acid, zinc, selenium, and vitamins A, C, and D can adversely impact immune function.⁶ Considering that the HIV population faces a heightened risk of malnutrition,^{7,8} ensuring adequate nutrition becomes an essential component of healthcare for individuals living with HIV.

Malnutrition and HIV are strongly related; HIV can induce or exacerbate malnutrition as a result of inadequate energy intake, nutrient malabsorption, and increased energy requirement.^{3,6} Malnutrition leads to weight loss, muscle wasting, nutrient deficiencies and then impairs the immune system.⁹ This cascade effect establishes a vicious cycle that might expedite the progression from HIV infection to AIDS,¹⁰ thereby increasing the risk of mortality.⁶ Implementing proper nutrition interventions, such as supplementing specific nutrients to counter malnutrition problems, is crucial for sustaining the nutritional status and overall health outcomes of individuals living with HIV.^{11,12}

Despite advancement in HIV prevention and treatment, which have turned HIV infection into a manageable chronic health condition, the nutrition needs for people acquired with HIV remain incomplete. This article aims to provide an informative overview of some essential dietary requirements to facilitate optimal nutritional intake among those living with HIV/AIDS. By addressing these nutritional considerations, we can contribute to improving the overall health and well-being of individuals coping with HIV infection.

Nutrition Guidelines

Irrespective of HIV status, prioritizing healthy eating is crucial. A widely accepted guideline for achieving a balanced diet is the "MyPlate" model, which recommends allocating half of the plate to fruits and vegetables, one-quarter to whole grains, and one-quarter to lean proteins, legumes, or nuts.¹³ Additionally, the MyPlate model advocates for incorporating a serving of low-fat dairy on the side.¹³ It is important to note that MyPlate emphasizes the consumption

of minimally processed fruits and vegetables, excluding fruit juice, as one of its specific recommendations.¹³ Such approach to nutrition can benefit individuals regardless of their HIV status, promoting overall health and well-being.

Another valuable guideline is the "Healthy Eating Plate" developed by the Harvard T.H. Chan School of Public Health, which emphasizes the importance of choosing healthy fats and avoiding highly processed foods and sugary drinks.¹⁴ Additionally, the Healthy Eating Plate underscores the significance of maintaining physical activity throughout the day to aid in weight management.¹⁴ Both "MyPlate" and "Healthy Eating Plate" models should be used as a guide in creating healthy and balanced meal to support overall health and well-being regardless of one's HIV status.

The topic of dietary guidelines specifically tailored for individuals living with HIV is not included in the 2020 to 2025 Dietary Guidelines for Americans and the Malaysia Dietary Guidelines 2020. However, it is advisable for individuals with HIV to adhere to evidence-based dietary guidelines that support a healthy lifestyle. It is important to understand that nutrients and foods do not act in isolation, and there is no single "magic bullet" that can cure or eliminate HIV. As emphasized by the dietary guidelines,^{15,16} the focus has shifted toward dietary patterns that are applicable regardless of age, race, ethnicity, economic status, or health status. This strategy recognizes that a holistic approach to nutrition benefits everyone.

Specific Nutrition Guidelines

Energy Requirement

Energy is essential for maintaining a healthy body weight and lean body mass, and its reduction can have detrimental effects on HIV patients, leading to a poor prognosis.¹⁷ Inadequate energy intake can be triggered by various factors, including oral candidiasis, infections leading to a diminished appetite, side effects of antiretroviral medications (e.g., nausea, vomiting, diarrhea), metabolic repercussions of malnutrition, and psychosocial factors like a lack of emotional support.¹⁸ The energy requirements for people living with HIV depend on several variables, including their weight, age, sex, level of physical activity, and overall health status. It is crucial to tailor dietary recommendations to individuals' unique circumstances to ensure they receive sufficient energy for their specific needs. In general, it is recognized that the resting energy expenditure in adults with untreated asymptomatic HIV is approximately 10% higher than that in individuals without HIV.¹⁹ The same holds true for asymptomatic adults receiving antiretroviral therapy, as well as those dealing with HIV wasting and secondary infections.¹⁵ For symptomatic HIV and later stage of AIDS, it is estimated that the energy requirements would increase by approximately 20 to 30% to maintain healthy body weight.²⁰

Based on current data, here are some general guidelines for estimating energy requirements for HIV-positive patients: For individuals with HIV without significant weight loss, the energy requirement is typically around 30 to 35 kcal/kg of body weight per day. On the other hand, for

individuals with HIV who have experienced significant weight loss or wasting, the energy requirement may be as high as 40 to 45 kcal/kg of body weight per day. However, in severe malnourished cases in critical setting that involve refeeding syndrome, defined by a group of electrolytic changes associated with metabolic abnormalities that can occur as a result of reintroduction of nutritional support (oral, enteral, or parenteral),²¹ certain management guidelines, such as those provided by the American Society for Parenteral and Enteral Nutrition Consensus Recommendations for Refeeding Syndrome or National Institute for Health and Care Excellence guideline CG32, should be followed.^{21,22}

Protein Requirement

The immune system of an HIV-positive person becomes compromised, particularly during the later stages of the disease, leading to a clinical state of protein deficiency that necessitates higher protein intake to support the weakened immune system.^{23,24} However, according to the Academy of Nutrition and Dietetics and the World Health Organization (WHO), there is currently insufficient data to conclusively recommend an increase in protein intake for people with HIV.^{20,25} They suggest that protein intake should be personalized, aiming for around 15% of total energy intake.²⁰

However, certain professionals recommend protein requirements of 1.0 to 1.4 g per ideal body weight kilogram (g/kg) for maintenance and 1.5 to 2.0 g/kg for anabolism.²⁶ According to the European Society for Clinical Nutrition and Metabolism (ESPEN) guidelines on enteral nutrition for wasting in HIV and other chronic infectious diseases, it is outlined that the target protein intake should be 1.2 g/kg of body weight per day during stable phases of the disease, and this may be increased to 1.5 g/kg of body weight per day during acute illness.²⁷ There is no doubt that individuals with HIV/AIDS require increased protein and micronutrient intake to support their weakened immune system.

Taking all factors into account, the author aims to suggest protein intake recommendations within the range of 1.0 to 1.2 g per kilogram per day (g/kg/day) for maintenance purposes. To address the additional demands of physiological stress, such as infections, a slightly higher intake of 1.3 to 1.5 g/kg/day is suggested. However, when dealing with acute illness and situations requiring enhanced anabolism, protein intake exceeding 1.5 g/kg/day is recommended. Furthermore, it is important to note that the distribution of high-quality protein should be spread evenly throughout the day to optimize muscle maintenance.²⁸ This approach to protein intake takes into consideration the varying needs of individuals, especially those with HIV/AIDS, as they navigate different phases of health and wellness.

Fat Requirement

There is no special fat requirement being reported for HIV population except for those who are experiencing side effects of antiretroviral therapy such as diarrhea. Optimal intake of fat (25–30% of total energy) is recommended to maintain optimal health. In line with the latest dietary guidelines, it is advisable for individuals to reduce their

saturated fat intake as part of a personalized healthy dietary pattern, as this reduction has been associated with decreased levels of total cholesterol, low-density lipoprotein (LDL) cholesterol, and a lower risk of cardiovascular disease events.²⁹ A diet rich in monounsaturated and polyunsaturated fats, found in sources like nuts, seeds, fish, and vegetable oils, is generally considered healthier and can help lower LDL cholesterol levels.³⁰ The American Heart Association further recommends that adults aim to consume less than 5 to 6% of their total daily energy intake from saturated fats and should avoid trans fats.³¹ These dietary choices can contribute to improved cardiovascular health, which is especially important for individuals with HIV/AIDS, as they may be at increased risk for certain cardiovascular complications.

Micronutrient's Requirements

In addition to macronutrients intake, people living with HIV/AIDS also require attention on the intake of essential micronutrients to boost their immune function and overall health. A diet that provides sufficient micronutrients to meet the recommended dietary allowance (RDA) should be encouraged. If it is anticipated that dietary intake may be insufficient, a daily multivitamin and mineral supplement at levels providing 100% of the RDA can be beneficial.²⁶ These recommendations align with the guidelines set forth by the WHO in 2003,²⁰ and the review article published by Forrester and Sztam in 2011.³²

The use of herbs and dietary supplements is widespread among people living with HIV.^{33,34} There is a risk of possible interactions between selected dietary supplements with the antiretroviral medicines that may result in decrease in the therapeutic effect of the medicines and increased risk of viral resistance.³⁵ Furthermore, there is no evidence to suggest that higher levels of supplementation lead to improved outcomes for HIV in adults.³⁶ Regarding complementary and alternative medicine (CAM), there is currently a lack of robust scientific literature to establish its safety and efficacy for people living with HIV.³⁷ In light of these uncertainties and potential risks, it is crucial for patients to consult their healthcare provider³⁴ or dietitian before considering any supplements or CAM interventions to ensure safety and to make informed decisions regarding their nutrition intervention regimen.

Sample Menu

Overall, for people living with HIV, the diet should be individualized based on a thorough nutrition assessment by a professional. ► **Table 1** provides a suggested balanced sample menu for people living with HIV, providing the right amount of nutrients for good health.

Nutrition Intervention

As part of nutrition care process, nutrition screening is the process of identifying patients or clients who may have a nutrition diagnosis and benefit from nutrition assessment and intervention by a dietitian.³⁸ While numerous

Table 1 Sample 1-Day Meal Plan

	1,600 kcal/day	1,800 kcal/day	2,000 kcal/day
Breakfast	<ul style="list-style-type: none"> • Egg sandwich—2 slices (1 egg) • Butter—1 tsp • Coffee with fat-free milk—1 cup 	<ul style="list-style-type: none"> • Egg sandwich—3 slices • Mayonnaise—1 tsp • Masala chai—1 cup 	<ul style="list-style-type: none"> • Fried noodles—2 cups • Minced chicken—½ piece • Fat-free milk—1 cup
Morning snack	(None)	<ul style="list-style-type: none"> • Boiled chickpea chaat—½ cup • Jaggery—1 cup 	<ul style="list-style-type: none"> • Masala potato bites (Kenya-inspired)—¾ cup • Roasted chana flour (besan)—1 cup
Lunch	<ul style="list-style-type: none"> • Rice—1 Chinese bowl • Chicken curry cooked with dhal—1 piece • Mixed vegetables (boiled)—1 cup • Papaya—1 slice • Jaggery—1 cup 	<ul style="list-style-type: none"> • Rice—1 Chinese bowl • Mixed vegetables dhal—1 cup • Chicken in black pepper sauce (Ayam sos lada hitam)—1 piece • Watermelon—1 slice • Plain water—1 cup 	<ul style="list-style-type: none"> • Rice—1 Chinese bowl • Tandoori Tofu skewers—1 piece • Stir-fried mixed vegetable—1 cup • Pear—1 piece • Plain water—1 cup
Afternoon snack	<ul style="list-style-type: none"> • Whole wheat crackers—4 pieces • Sattu drink—1 cup 	<ul style="list-style-type: none"> • Kaya toast—2 pieces • Scrambled egg—1 • Energy drink—1 cup 	<ul style="list-style-type: none"> • Cream crackers—6 pieces • Deviled egg/soft-boiled egg—1 whole • Energy drink—1 cup
Dinner	<ul style="list-style-type: none"> • Rice—1 Chinese bowl • Fish cooked in black pepper sauce—1 whole • Stir-fried vegetables—1 cup • Orange—1 whole • Plain water—1 cup 	<ul style="list-style-type: none"> • Rice—1 Chinese bowl • Mixed vegetables (boiled)—1 cup • Spicy tamarind fish (Ikan masak asam pedas)—1 whole • Papaya—1 slice • Plain water—1 cup 	<ul style="list-style-type: none"> • Rice—1 Chinese bowl • Mackerel in low-fat coconut milk—½ whole • Hard-boiled eggs—1 whole • Vegetable soup—1 cup • Apple—1 whole • Plain water—1 cup
Supper	<ul style="list-style-type: none"> • Plain bun—1 medium size • Fat-free milk—1 cup 	<ul style="list-style-type: none"> • Ragi porridge—1 cup • Fat-free milk—1 cup 	<ul style="list-style-type: none"> • Roasted nuts—½ cup • Fat-free milk—1 cup

Macronutrient distribution: 55% carbohydrate, 20% protein, 25% fat of total energy.

malnutrition screening tools exist, only one specific nutrition screening tool has been developed by registered dietitians in the United States for individuals living with HIV.³⁹ This unique tool, known as rapid nutrition screening for HIV disease (RNS-H), has undergone validation to ensure its effectiveness and accuracy in identifying nutritional concerns in this specific population.^{25,39} The RNS-H tool consists of seven questions. Each item on the RNS-H tool has an assigned point value based on severity and contribution to nutritional risk. Based on the total score, an individual will be assigned to one of three nutritional status: score of 0 to 3 is defined as “low risk,” 4 to 6 is defined as “at risk,” and 7 to 15 is defined as “high risk.”³⁹

In light of the increasing demand for healthcare resources to manage HIV in certain regions, the author proposes a risk-stratified approach to nutrition intervention. This approach leverages the RNS-H tool to categorize individuals based on their level of nutritional risk, allowing for a more targeted and efficient allocation of healthcare resources. By tailoring nutrition interventions to the specific needs of each individual, healthcare providers can optimize care delivery and enhance the overall well-being of those living with HIV while also making prudent use of limited healthcare resources, particularly in regions with a high prevalence of HIV/AIDS.

Each nutrition risk group is then provided with a different level of nutrition care, based on their individual needs. Using

this approach, registered dietitians will be able to identify which individuals require intensive nutrition intervention and which require minimal nutrition intervention. In the case of the low-risk group, the primary objective of nutrition care is to maintain their nutritional status. For instance, individuals in this category may receive general nutrition advice aimed at meeting their macro- and micronutrient requirements. On the other hand, those individuals who are at risk of malnutrition will undergo assessments to identify the underlying causes of their malnutrition. Subsequently, nutrition interventions will be tailored to address specific nutrition-related symptoms (e.g., nausea, vomiting, diarrhea) that impact appetite and oral intake. Conversely, high-risk individuals may necessitate more specialized nutrition interventions, such as the provision of oral nutrition supplements or enteral and parenteral nutrition support.

Regardless of risk group, all patients should receive education on personal hygiene practices and food safety to minimize the risk of infections.⁴⁰ Nutrition interventions may recommend exercise training, including resistance training, to build or maintain muscle mass^{41,42}; it is important to consider that people with HIV are more susceptible to sarcopenia.⁴³ On the other hand, exercise training has been shown to improve immune function,⁴¹ body composition,⁴¹ and appetite in people living with HIV.⁴⁴ As part of HIV care, the use of broad-spectrum anthelmintics

(deworming drugs) biannually has been recommended for these individuals.⁴⁵

Conclusion

While a well-balanced diet should be the cornerstone of any HIV nutritional plan, certain dietary supplements may assist in supporting immune function and overall health for individuals living with HIV, especially when there is inadequate intake of micronutrients. It is crucial to emphasize that dietary supplements and CAM should not serve as substitutes for a healthy diet or medical treatment. The author recognizes the importance of personalized, risk-stratified nutrition therapy in supporting nutritional status and overall health in the management of HIV nutrition. Therefore, individuals living with HIV are encouraged to collaborate with a registered dietitian or nutritionist to develop a tailored nutrition plan that considers their unique needs and goals, regardless of their HIV stage.

Author's Contribution

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Conflict of Interest

None declared.

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