Collaborative Care to Assess Risk and Eliminate Polypharmacy, Falls, and Fragility Fractures (4F) for People Aging with HIV

Appendix

TABLE OF CONTENTS

Appendix	Page
Appendix A: **Screening & Assessment Tools**	
A1. Patient Demographics Screening	4
A2. Anxiety Screening (GAD-7)	5
A3. Vitals Screening	5
A4. PHQ-2	5
A5. Mental Health Diagnoses Screening	6
A6. Physical Health Diagnoses Screening	6
A7. Substance Use Screening	7
A8. AUDIT-C	7
A9. Health Literacy Screening Tool	7
A10. Sleep Quality Screening	7
A11. Osteoporosis Screening	8
A12. Fall Risk Screening	8
A13. Foot Exam/Footwear	9
A14. Key Factors that Impact Health Questions	9
A15. Vision Assessment	10
A16. Gait Assessment	10
A17. FRAX Calculator	11
A18. VACS Index 2.0 Calculator	11
A19. Serious Fall Risk Calculator	12
Appendix B: Intervention Materials	
B1. Provider Chart Review	13
B2. Provider Chart Medication Review	14
B3. Labs - Coordinator	15
B4. Tip Sheets	16
B5. 4F Assessment Visit Checklist	22
B6. Provider Training PowerPoint: HIV & Aging: Pharmacy	23
B7. Provider Training PowerPoint: Risk Assessments & Prevention of Serious Falls	23

B8. Provider Training: Live Gait and Balance Demonstration	23
B9. Provider Training PowerPoint: Fracture Screening & Management	24
Appendix C: **Process Maps**	
C1. 4F Block Diagrams	25
C2. HIV Champion Provider Training: Task Analysis Diagram	25
C3. 4F Screening Diagram	26
Appendix D: Operational Guidance	27
Appendix E: **References – available upon request.**	

Acknowledgment

This project is supported by the Health Resources and Services Administration (HRSA) of the U.S. Department of Health and Human Services (HHS) as part of an award totaling $2,400,000, with zero percentage financed with non-governmental sources. The contents are those of the author(s) and do not necessarily represent the official views of, nor an endorsement by, HRSA, HHS, or the U.S. Government. For more information, please visit HRSA.gov.

This intervention was implemented by Yale University in the Health Resources and Services Administration Ryan White HIV/AIDS Program Special Projects of National Significance aging with HIV project. Yale University used the following tools, intervention materials, process maps, operational guidance, and references when implementing the intervention. Contact Lydia Aooun-Barakat (lydia.barakat@yale.edu) with questions.

Appendix A1: Patient Demographics Screening

Demographics – COORDINATOR Completed ahead of time through EPIC	
Age:	_____ years
Race: Circle all that apply.	American Indian or Alaskan Native Asian Black or African American Native Hawaiian or Other Pacific Islander White Don't Know Declines to Answer Other: _____
Ethnicity:	Hispanic Non-Hispanic Other: _____
Sex:	Male Female
Do you currently smoke cigarettes?	Yes No
If no, have you ever smoked cigarettes?	Yes No
Do you currently consume marijuana (smoke, consumables)?	Yes No
If no, have you ever consumed marijuana?	

Appendix A2: Anxiety Screening (GAD-7)[1]

The GAD-7 Anxiety Screening is a quick and easy tool to help identify patients with anxiety and monitor treatment response.

GAD-7

Appendix A3: Vitals Screening

Vitals – MA, PCA or NURSE
Current Pain **What is your pain on a scale of 0-10?** (circle answer) 0 1 2 3 4 5 6 7 8 9 10 **Where is your pain?** (open-ended) _____ _____ **Orthostatics:** **Blood Pressure lying down (mmHg):** ____ / _____ **Pulse lying down (bpm):** _____ **Blood Pressure standing (mmHg):** ____ / _____ **Pulse standing up (bpm):** _____ **Height (inches):** _____ **Weight (pounds):** _____ **BMI (calculate:** available **in Epic):** _____

Appendix A4: Patient Health Questionnaire-2 (PHQ-2)[2]

The Patient Health Questionnaire-2 (PHQ-2), which is comprised of the first two items of the PHQ-9, is a brief tool designed to screen for depression by assessing depressed mood and anhedonia over the past two weeks.

PHQ-2

Appendix A5: Mental Health Diagnoses Screening

Mental Health Diagnoses (please circle all that apply)- PROVIDER
Do you now or have you ever had any of the following diagnoses? (Please circle all that apply)
Major depression Mild depression Bipolar disorder Psychosis Post-traumatic stress disorder Anxiety disorder Schizophrenia Schizoaffective disorder Alzheimer disease Cognitive impairment Dementia
Total count of reported mental health conditions: _____

Appendix A6: Physical Health Diagnoses Screening

Physical Health Diagnoses (please circle all that apply)- PROVIDER		
Do you now or have you ever had any of the following diagnoses? (Please circle all that apply)		
Anemia Asthma COPD Coronary artery disease Heart failure Cirrhosis/end-stage liver disease Cerebrovascular disease/stroke HBV HCV HIV Hypertension Nocturia Dyslipidemia Peripheral vascular disease Osteoarthritis Diabetes Renal insufficiency/renal failure Blindness Cataracts Convulsions/seizures Peripheral artery disease Incontinence Dizziness Abnormal gait Urinary frequency		
Total count of reported physical health conditions: _____		
For FRAX: Does the respondent have a history of rheumatoid arthritis?	Yes	No

Appendix A7: Substance Use Screening

Substance Use (please circle all that apply)- PROVIDER
Do you now, or have you ever used any of the following substances?
PCP
Other hallucinogens
Inhalants
Non-prescribed opioids, including heroin
Non-prescribed sedatives, hypnotics, or anxiolytics
Stimulants (includes cocaine or methamphetamine)

Appendix A8: AUDIT-C[3]

The AUDIT-C (Alcohol Use Disorders Identification Test-Consumption) is a brief, 3-item screening tool for detecting hazardous drinking and potential alcohol use disorders. It focuses on the frequency and quantity of alcohol use, with higher scores generally indicating a greater likelihood of alcohol-related problems or active alcohol use disorders.

AUDIT-C

Appendix A9: Health Literacy Screening Tool[4]

The Health Literacy Screening Tool is a four-question self-report assessment used to quickly determine a patient's health literacy level.

Appendix A10: Sleep Quality Screening

Sleep Quality - PROVIDER			
Do you have trouble falling asleep at night?	Yes	Sometimes	No
Do you have trouble staying asleep at night?	Yes	Sometimes	No
Do you have to get up often at night to use the bathroom?	Yes	Sometimes	No
Do you have trouble falling back asleep after waking up at night?	Yes	Sometimes	No
Are you tired during the day?	Yes	Sometimes	No
Do you feel refreshed when you wake up in the morning?	Yes	Sometimes	No
How many hours of sleep do you get at night?	_____		

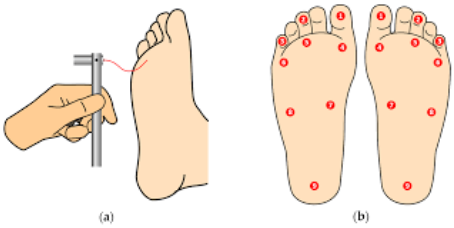
Appendix A11: Osteoporosis Screening

Osteoporosis Screening - PROVIDER	
Have you ever broken a bone as an adult?	Yes No
If yes, what bone?	_____
Did either of your parents ever fracture a hip?	Yes No I don't know
Have you ever had a bone mineral density scan, or DXA-scan?	Yes No I don't know
Are you being treated for Osteoporosis?	Yes No
If yes, what medications are you taking?	_____

Appendix A12: Fall Risk Screening

Fall Risk - PROVIDER	
Have you slipped or tripped and hurt yourself in the past 12 months?	Yes No
Have you slipped or tripped and not hurt yourself in the past 12 months?	Yes No
Have you had a serious fall (a fall for which you went to see a provider – either in clinic or in the emergency room) within the last 12 months?	Yes No
Do you use an assistive device for walking?	Yes No
If yes, which of the following devices do you use? Circle all that apply.	Standard cane | Quad Cane | Walker | Rollator Wheelchair | Crutches Other: _____
How often do you need physical assistance with standing or walking?	Never Sometimes Often Always
Do you have throw rugs in your home?	Yes No
Are there obstacles that you need to walk around in your home?	Yes No
Do you have a slippery bathtub or shower floor?	Yes No
Do you have lights on the path from your bed to the bathroom?	Yes No

Appendix A13: Foot Exam / Footwear

Foot Exam / Footwear - PROVIDER	
Is the patient wearing appropriate shoes (e.g., flip-flops can be dangerous)?	Yes No
Check feet and toenails. Does the patient have: • Onychomycosis • Long or cracked toenails • Fungus between the toes • Pedal pulses	Yes No Yes No Yes No Yes No
Is there evidence that the patient's shoes may be rubbing their feet?	Yes No
Assess sensation on the bottoms of the patient's feet using a 10g monofilament. Please circle areas of decreased sensation.	Yes No
Assess vibratory sense on the feet by applying the base of a vibrating 128 CPS tuning fork to the great toe and ask the patient to describe the sensation. It is best to test patients with their eyes closed and ask them to determine whether the tuning fork is vibrating or not.	
Monofilament testing decreased int right foot?	Yes No
Monofilament testing decreased int left foot?	Yes No
Vibratory sense decreased on R great toe	Yes No
Vibratory sense decreased on L great toe	Yes No

Appendix A14: Key Facors that Impact Health Questions

Are you worried that in the next two months, you may have unstable housing?	Yes No
If the answer is yes, please refer to the social worker (Optional).	Yes No
Are you worried that in the next two months you may run out before you get money to buy food?	Yes No
If the answer is yes, please refer to the social worker (Optional).	
Do you have transportation to get to your medical appointments?	Yes No
Do you have transportation to buy groceries?	Yes No
If the answer is no, please refer to social worker (Optional).	Yes No

Appendix A15: Vision Assessment

What matters most to the patient regarding their health? PROVIDER

The HIV champion provider walks the patient to the hallway outside the exam rooms and conducts the vision exam using a traditional eye chart, eye cover, and pointer at a 20 foot testing interval for the patient.

Vision - PROVIDER	
Do you wear glasses or contact lenses?	Yes No
Can you afford glasses if you need them?	No/I think I might need them
Do you have trouble seeing or reading, even when wearing glasses or contacts?	Yes No
"**Now we are going to test your vision. Please walk out of the room with me."**	
• WALK OUT OF THE ROOM WITH THE PATIENT TO THE VISION AREA. • MAKE SURE TO HAVE AN EXTRA PIECE OF PAPER SO THE PATIENT CAN COVER THEIR EYE. • BLUE LINE SHOULD BE 6 METERS AWAY FROM SNELLEN CHART.	Yes No
"**Please stand behind the blue line and cover your right eye. Please read off the chart starting with the top row."**	LEFT EYE SCORE: 20/ _____
PATIENT SHOULD READ UNTIL THEY MAKE AN ERROR; LOOK AT THE CHART FOR THE SCORE.	
"**Excellent. Now cover your left eye. Please read off the chart, starting with the top row, again."**	RIGHT EYE SCORE: 20/ _____
PATIENT SHOULD READ UNTIL THEY MAKE AN ERROR; LOOK AT THE CHART FOR THE SCORE.	

Appendix A16: Gait Assessment

Gait – PROVIDER **Patient walks the full length of the hallway and does a complete turn for observation of gait**	
Observe and describe the patient's gait. Circle any of the descriptors that apply:	No limitations Wide-based Narrow-based Shuffling Dragging feet Unsteady/shaky Leaning Limping Swaying Staggering Slow Fast Foot drop Forward flexed posture Legs cross while walking (scissor gait)

Debrief time and summary of findings/next steps- PROVIDER

Appendix A17: Fracture Risk Assessment Tool (FRAX) Calculator[5]

The HIV champion provider conducts the Fragility Fracture Risk Questionnaire using the Fragility Fracture Risk Screening Tool and Calculator.

FRAX Calculator

Appendix A18: Veterans Aging Cohort Study (VACS) Index 2.0 Calculator[6]

Duration: < 5 minutes
Administered by: MD if appropriate
Description: Incorporates general health (age, hemoglobin, Fibrosis-4 Index for Liver Fibrosis [FIB-4], estimated glomerular filtration rate [eGFR], hepatitis C virus [HCV]), and HIV-specific (HIV-1 RNA and CD4 cell count) clinical data to characterize overall disease burden and reflect risk of mortality.

VACS 2.0 Index

Veterans Aging Cohort Study (VACS) 2.0 Index. (2024). MDCalc.

Appendix A19: Serious Fall Risk Calculator

Serious Fall Risk Calculator - PROVIDER or automatically generated	
Sex	Female Male
Race/Ethnicity	Black White Hispanic Other:_____
BMI $\geq$ 25 kg/m^2	Yes No
Serious fall in the past year	Yes No
Diagnosis of alcohol use disorder	Yes No
Result of AUDIT-C (0-12)	_____
Within the past year, has the patient had a prescription for any of the following?	
Anticonvulsant	Yes No
Benzodiazepine	Yes No
Muscle relaxant	Yes No
Opioid	Yes No
SSRI	Yes No
Current medication count (excluding topicals, ophthalmologic solutions, otic solutions, and ART)	_____
How many mental health conditions does the patient have?	_____
How many physical health conditions?	_____
Most recent pain score	_____
VACS Index 2.0 score	_____
Serious Fall Risk Score:_____	

Appendix B1: Provider Chart Review

CHART REVIEW PRIOR TO VISIT

Mental Health Diagnoses (In Problem List or elsewhere documented in patient chart. Please circle all that apply)- PROVIDER CHART REVIEW	
Major depression	Schizophrenia
Mild depression	Schizoaffective disorder
Bipolar disorder	Alzheimer disease
Psychosis	Cognitive impairment
Post-traumatic stress disorder	Dementia
Anxiety disorder	
Total count of documented mental health conditions: _____	

Physical Health Diagnoses (In Problem List or elsewhere documented in patient chart. Please circle all that apply)- PROVIDER CHART REVIEW	
Anemia	Peripheral vascular disease
Asthma	Osteoarthritis
COPD	Diabetes
Coronary artery disease	Renal insufficiency/renal failure
Heart failure	Blindness
Cirrhosis/end-stage liver disease	Cataracts
Cerebrovascular disease/stroke	Convulsions/seizures
HBV	Peripheral artery disease
HCV	Incontinence
HIV	Dizziness
Hypertension	Abnormal gait
Nocturia	Urinary frequency
Dyslipidemia	**Total count of documented physical health conditions**: ____
For FRAX: Does the respondent have a history of rheumatoid arthritis?	Yes No

Substance Use Disorders (In Problem List or elsewhere documented in patient chart. Please circle all that apply)- PROVIDER CHART REVIEW		
Alcohol use disorder	Cannabis use disorder	Phencyclidine use disorder
Other hallucinogen-use disorder	Stimulant use disorder (includes cocaine or methamphetamine)	
Sedative, hypnotic, or anxiolytic use disorder	Inhalant use disorder	Opioid use disorder
Total count of documented substance use disorders: _____		

Appendix B2: Provider Chart Medication Review

Medication Review – reviewing prior to meeting with the patient and then confirming when the patient is in your office may help to shorten the time required for the medication reconciliation. PROVIDER CHART REVIEW – The patient should have been notified to bring in medications for the visit			
Question	Answer		Recommendations
1) How many medications is the patient prescribed (total*)? *INCLUDES OTCs, vitamins, herbals, supplements, inhalers, and injectables. Does NOT include topicals, PRNs, optics, or otics.	(Free text)	Circle one: < 9 9 – 14 (polypharmacy) ≥ 15 (hyperpolypharmacy)	
2) Total number of tablets/pills is the patient prescribed? Example: 1 tablet BID or 2 tablets daily = 2	(Free text)		
3) How many HIV medications is the patient prescribed? Be sure to include non-oral therapies such as long acting injectables or infusions. Example: Biktarvy® = 1 medication, Norvir BID = 1 medication.	(Free text)		
4) How many NON-HIV ART medications are the patient prescribed? (#1 minus #3)	(Free text)		
5) Does the patient have any medications that require multiple daily doses?	YES NO If yes, circle the prescribed dosing: BID TID 4x/day		
6) Is the patient prescribed a high-risk medication that can contribute to the risk of falls and fragility fractures?	Anticonvulsant Yes No Benzodiazepine Yes No Opioid Yes No SSRI Yes No Muscle relaxant Yes No Glucocorticoid Yes No		
7) Is the patient on any potentially inappropriate medications (PIMs) for older adults[†]? [†]	YES NO If yes, please list:		

Appendix B3: Labs – Coordinator

Nurses and ambulatory care assistants draw patient's blood based on the labs requested by the HIV champion provider (recent labs within the last 6 months do not need to be repeated).

Labs- COORDINATOR	
Labs to order if needed (if labs not within the last 6 months): • CBC • CMP • CD4 count • HIV-1 RNA • HCV • Vitamin D • Vitamin B12 • TSH	
CBC Date: _____	HGB: _____ HCT: _____ Platelets: _____ WBC: _____
CMP Date: _____	Creatinine: _____ eGFR: _____ Albumin: _____ ALT: _____ AST: _____
CD4 count Date: _____	_____
HIV viral load Date: _____	_____
Vitamin D Date: _____	_____
Hep C antibody (ever) Date: _____	Positive Negative
Hep C PCR (if HCV antibody positive) Date: _____	_____

Appendix B4: Tip Sheets

Provider Tip Sheet

Daily Vitamin D and Calcium requirements (should be encouraged from dietary sources)

Vitamin D (RDAs)

Age	Male	Female
51 – 70 years	15 mcg (600 IU)	15 mcg (600 IU)
> 70 years	20 mcg (800 IU)	20 mcg (800 IU)

Vitamin D - Health Professional Fact Sheet (nih.gov)

Calcium (RDAs)

Age	Male	Female
51 – 70 years	1,000 mg	1,200 mg
> 70 years	1,200 mg	1,200 mg

Calcium - Health Professional Fact Sheet (nih.gov)

Fragility Fractures Risk Assessment:

Until a better predictive model is available, please use FRAX to screen patients for fracture risk based upon 10 well-established risk factors (age, sex, BMI, glucocorticoid use, history of rheumatoid arthritis, smoking, excessive alcohol use, personal history of fragility fracture as adult, parental history of hip fracture after 50 years of age, and secondary osteoporosis): https://www.fraxplus.org/calculation-tool/

FRAC will be calculated without bone mineral density data unless the patient has a recent (within the past 2-3 years) DXA scan. If there is a recent DXA and if you have femoral neck T-score, please include this in the calculations. Protocols (most of this protocol is taken from Brown, T.T, et all (2015). Recommendations for evaluation and management of bone disease in HIV. *Clinical Infectious Disease*. 60(8):1241-1251.)

Screening tool:

Screen all patients 50+ years of age for risk of fragility fracture using FRAX
https://www.fraxplus.org/calculation-tool/
Note: check the box for "secondary cause" of osteoporosis for all persons with HIV.

Fracture risk	Definition	Management
Low	<10% 10-year risk of major osteoporotic fracture	Provide lifestyle counseling; reassess in ≤5 years
Moderate/Intermediate	10–20% 10-year risk of major osteoporotic fracture	Measure BMD and reassess risk
High	≥20% or hip fracture ≥3%	Discuss treatment and provide counseling

Bone mineral density T-score thresholds for determining osteopenia and osteoporosis:

T-score*	Normal	Osteopenia	Osteoporosis
	≥ -1T-score*	Between -2.5 and -1	≤ -2.5

*T-score: the number of standard deviations the patient's bone mineral density is above or below the mean for a healthy young adult

Management of Osteoporosis:

I. <u>If the patient is diagnosed with osteoporosis:</u>

In addition to the risk factors screened for with FRAX, explore possible secondary causes (see below). If any of these secondary causes are positive, refer to the appropriate specialist.

Osteoporosis-associated condition	Laboratory evaluation
Endocrine disorders	
Vitamin D deficiency	25-hydroxy vitamin D
Hyperparathyroidism	Intact parathyroid hormone, total calcium, phosphate, albumin, and creatinine
Subclinical hyperthyroidism	TSH, free T4
Hypogonadism	Men: AM free testosterone Women: menstrual history, estradiol, FSH, prolactin
Cushing syndrome	1 mg overnight dexamethasone suppression test or late-evening salivary cortisol
Renal disorders	
Phosphate wasting	Simultaneous serum phosphate and creatinine, and spot urine phosphate and creatinine to calculate the fractional excretion of phosphate
Idiopathic hypercalciuria	24-hour urinary calcium
GI disorders	
Celiac sprue	IgA tissue transglutaminase antibody
Hematologic disorders	
Multiple myeloma	Complete blood count, serum protein electrophoresis
Mastocytosis	Serum tryptase

II. <u>If no evidence of secondary osteoporosis (other than HIV infection):</u>

1. If patients require treatment, bisphosphonates are typically first-line medications.
    - Which bisphosphonates should be used to start:
        1. Alendronate (PO) and Zoledronic acid (IV) have both been shown in clinical trials to have benefits for people with HIV.
    - Contraindications:
        1. Hypocalcemia.
        2. CKD with GFR <30-35.
        3. Hypersensitivity to bisphosphonates.
        4. History of dental problems/ONJ.
        5. History of atypical femoral fractures.
    - For oral bisphosphonates, avoid in patients with:
        1. Esophageal disorders (e.g., achalasia, esophageal stricture, esophageal varices, Barrett's).
        2. Inability to stand or sit upright for at least 30 minutes after taking medications.
        3. History of bariatric surgery (Roux-en-Y gastric bypass).

2. Baseline and follow-up monitoring considerations
    - Check baseline serum calcium, vitamin D, and renal function. Vitamin D deficiency should be addressed before bisphosphonate initiation.
    - Take a detailed dental history or consider referral for dental evaluation. Bisphosphonate therapy initiation should be delayed if planning an invasive dental procedure soon.
    - Bone mineral density should be evaluated at baseline and again on the same DXA machine in 1-2 years after initiating therapy. Subsequent follow-up intervals can be shorter if the patient is felt to have several unmodifiable risk factors, or longer if the DXA findings are stable/improved.
    - Annual measurements of height, weight, serum calcium, serum 25-hydroxyvitamin D, and an assessment of back pain to check for the development of compression fractures.

3. When to consider a referral to a specialist
    - If the patient has any causes of secondary osteoporosis felt to be outside of the purview of the HIV provider.
    - If the patient does not appear to be responding to first-line treatment (i.e., bisphosphonates).
    - If patients cannot tolerate first-line medications.

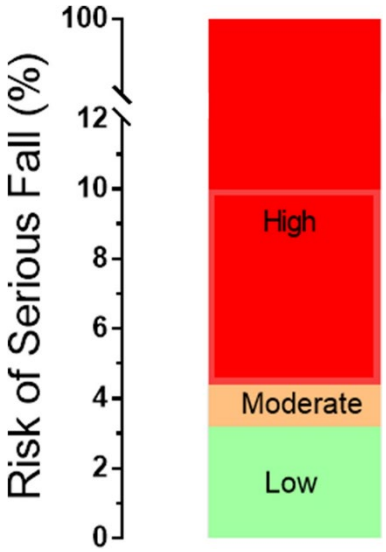
<u>Serious Falls:</u>

Please note – we will calculate the patient's risk for a serious fall after your visit has been completed (the algorithm needs to be run in REDCap). We will send you your patients' serious fall risk score along with recommendations for prevention/management of risk.

However, for your information, we are including a summary here of what is included in the serious falls risk model and what we recommend for management strategies by risk score category.

Variables
Main effects
Intercept
Female sex
Non-White race
BMI ≥ 25 kg/m^2
Serious fall within the past year
Diagnosis of alcohol use disorder
Hazardous alcohol use (Audit C score 0-12)
Anticonvulsants
Benzodiazepines
Muscle relaxants
Opioids
Selective serotonin reuptake inhibitors
Count of non-ART chronic medications
Count of mental health comorbidities
Count of physical comorbidities
Pain score
VACS Index 2.0 score
Two factor interactions
Female*count of non-ART chronic medications
Female*prior fall
Prior fall*alcohol use/abuse
Prior fall*count of physical comorbidities
Prior fall*pain

MODEL:



Risk score for serious falls:

Low risk: a score less than 3.1%. No intervention is necessary. Encourage patient to continue with any practices that are beneficial (e.g. low levels of alcohol use). Otherwise, repeat screen in 1 year.

Moderate risk: a score between 3.1% and 4.4%. Discuss with the patient that they are at risk, identify key risk factors, and provide encouragement/support for changing any at risk behaviors.

High risk: a score >4.4%. Identify key risk factors with patient and establish a plan for how to remediate these risks. For example, if the patient has polypharmacy, explore medications that can be discontinued or whose dose can be reduced. If using alcohol, explore alcohol cessation programs and ways to support them in decreasing/discontinuing their alcohol use.

We will provide you with both the risk score and the modifiable risk factors that could be considered for intervention.

HOW TO TAKE THE BEST POSSIBLE MEDICATION HISTORY (BPMH)

The medication dispense report within EHR can serve as a secondary source to cross-check a patient's medication list. It pulls in data from outside sources (outside pharmacies) that dispensed the medications through their health insurance.

Notes:

1. If a medication was dispensed by a pharmacy and the patient did not pay for it through health insurance (e.g., cash, free drug through manufacturer).
2. The dispense report displays the dispense dates for the prescriptions, but it is not a confirmation that the patient picked up the medication.
    a. TIP: If you would like to confirm a medication was picked up, you may also call the listed pharmacy that dispensed the medication to verify.

How to Access Dispense Report in EHR:

1. The medication dispense report can be accessed in multiple ways by accessing the "Reconcile Outside Records" icon to the right of the patient's ID photo, or by clicking "Go Reconcile" under the medications tab:
    a. NOTE: The icon and the "Go Reconcile" button only appear in patients who have outside records."

2. Be sure to be under the "Medications" tab within the "Reconcile Outside Information". Click on the "Dispense Report" blue hyperlink to access the medications dispense report.

3. The dispense report will provide you with a 12-month dispense history on the left. The right side provides the medication outside information older than 12 months.

4. Use the dispense report to verify the medication name, strength, date of dispensing, quantity, day supply, prescribing provider, and the specific pharmacy that dispensed the medication. Click "Expand All" to expand all medications.

HOW TO TAKE THE BEST POSSIBLE MEDICATION HISTORY (BPMH)

GOALS

• To obtain the most accurate list of medications that the patient is actually taking vs what the patient is supposed to be on

• Prevent potentially inappropriate medications (PIMs), drug-drug interactions (DDIs), and polypharmacy (especially in older adults)

• To obtain complete information on the patient's regimen, including:

- ✓ Name of each medication
- ✓ Formulation (e.g., extended release)
- ✓ Dosage
- ✓ Route
- ✓ Frequency

WHEN TO GATHER ADDITIONAL DATA

• Patient is unsure about medication names, doses and indications

• Patient cannot explain discrepancies in lists

• Patient does not have a list and can't provide medication information

• Sources of information are not updated recently

• The missing information is potentially dangerous

GATHERING ADDITIONAL DATA

• Contact outpatient pharmacies or access database of pharmacy information (e.g., dispense report)

• Contact outpatient providers

• Have a patient's family bring in pill bottles

• After gathering data, return to patient with directed questions

EXTRA TIP

• May utilize pill identifier and ask patient to recognize or describe the shape, color, and imprints on pills

TIME SAVING TIP

Start with easily accessible sources

• Medication list from outpatient record

• Recent hospital discharge summary

• Prescription fill information from patient's pharmacy

• Patient's home medication list

• Patient's pill bottles if available

IDEAL HISTORY ALSO INCLUDES

- ✓ Drug indications
- ✓ Any recent changes in the regimen
- ✓ Over-the-counter drugs
- ✓ Sample medications
- ✓ Vitamins, herbals, supplements
- ✓ Time of last dose
- ✓ Allergies and the associated reaction
- ✓ Prescriber(s)
- ✓ Pharmacy(ies)

TIPS FOR THE BPMH

1) Try to use at least two sources of information to explore discrepancies

Source #1 = Patient

- Patient (from interview)
- Patient-owned medication list
- Family members/caregivers
- Pill bottles

Source #2 = Other source

- Discharge orders from recent hospitalization
- Medication list, notes from outpatient providers, or dispense report in EHR
- Transfer orders from other facilities
- Pharmacy(ies) where patient fills

2) Have the patient do most of the talking

a) Start with open-ended questions

i) What medications are you currently taking?

ii) What allergies do you have?

3) Use probing questions to fill in the gaps and identify additional information

a) Ask about scheduled and PRN medications

b) Assess indication(s) of each medication

c) Ask about unique types of medications

d) Ask about non-prescription products

e) Assess adherence and time of last dose

Appendix B5: 4F Assessment Visit Checklist

The 4F Assessment Visit Checklist is used by the project coordinator to ensure that all elements of the intervention have been implemented.

Task	Personnel or Screeners	Task Completion Check
Patient check-in		
Patient arrives to appointment checks-in	Front desk	
Patient brought to exam room	Ambulatory care assistant or nurse	
HIV champion provider session		
Patient vitals Orthostatic check Pain score	Ambulatory care assistant or nurse	
BRIEF Health Literacy Screening Tool	Project coordinator	
AUDIT-C PHQ-2 GAD-7	HIV champion provider	
Mental health diagnoses check list	HIV champion provider	
Physical health diagnoses check list	HIV champion provider	
Substance use disorders check list	HIV champion provider	
Pharmacy assessment	HIV champion provider	
Sleep quality assessment	HIV champion provider	
Osteoporosis screening	HIV champion provider	
Fall risk assessment	HIV champion provider	
Foot exam/footwear	HIV champion provider	
FRAX calculator	HIV champion provider	
What matters most?	HIV champion provider	

Vision assessment	HIV champion provider	
Gait assessment	HIV champion provider	
Debrief on summary of findings and care plan/follow-up	HIV champion provider	
Provide educational material to patient and appropriate referral	HIV champion provider	
Patient gets labs drawn (if not done within the last 6 months)	Nurse	
Patient checks-out and schedules follow-up appointment (one year out)	Front desk or nurse	

Note: Some EHRs has educational materials such as home fall prevention checklist for older adults, preventing falls in adults, getting up from a fall, fractures, calcium rich diet, calcium and vitamin D for bone health. The materials have copyright protections and cannot be shared in publications.

Appendix B6: Provider Training PowerPoint: HIV & Aging: Pharmacy

This training focuses on equipping providers with skills and resources to accurately gather a patient's medication history and apply a pharmacy assessment screening tool, aiming to prevent medication-related issues like polypharmacy. Contact Lydia Aoun-Barakat (lydia.barakat@yale.edu) for more information.

Appendix B7: Provider Training PowerPoint: Risk Assessment and Prevention of Serious Falls

The training outlines the importance of fall prevention, identifies risk factors for serious falls, and presents a predictive model to assess fall risk in individuals, especially for those aging with HIV.

Appendix B8: Provider Training PowerPoint: Fracture Screening and Management

The training covers fracture screening and management strategies specifically for patients aging with HIV, covering assessment tools, lifestyle modifications, and pharmacological interventions to reduce fracture risk.

HRSA Training Session_HIV and Frac

Appendix B9: Provider Training: Live Gait and Balance Demonstration

Brief Overview of Balance Strategies

- Ankle.
- Hip.
- Trunk.

Live demonstration with explanation

When unsteady, one may see:

- Wide base of support.
- Forward flexed posture.
- Slow gait cadence.
- Festinating gait pattern.
- Furniture walking/reaching out to steady self.
- Shuffling gait.

When fear is involved, one may see:

- Retropulsion.
- Forward flexed.
- Shuffling steps.

If neuro involvement may be seen:

- Ataxia.
- Scissoring gait.
- Decreased arm swing/shuffling.
- Increased cadence.
- Foot drop.
- Foot slap.
- Hip hiking.
- Steppage gait.

Tips:

- Are they wearing a brace?
- Do they have pain-causing gait deviation?

Appendix C1: 4F Block Diagrams

Block Diagram

4F HIV Champion Provider Training:

Recruit eligible HIV providers	Schedule HIV champion provider training	Prepare for HIV champion provider training	Conduct HIV champion provider training	Evaluate HIV champion provider training

4F Wellness Visits:

Identify eligible patients	Offer 4F intervention	Schedule for 4F encounter	Conduct 4F screening and plan development	Provide referrals	Schedule 4F reassessment

Appendix C2: HIV Champion Provider Training: Task Analysis Diagram

Recruit Eligible HIV Providers	Prepare HIV Champion Provider Training	Schedule HIV Champion Provider Training	Conduct HIV Champion Provider Training	Evaluate HIV Champion Provider Training
HIV providers who work at the clinic and wish to be a part of and receive the 4F assessment training to enhance their clinical expertise and knowledge for their patients aging with HIV HIV providers who have a patient panel consisting of 50+ years old	Prepare HIV champion provider training slides Prepare pre- and post-test HIV champion provider training assessments Prepare HIV champion provider training handouts	Offer HIV champion provider training to the recruited eligible HIV providers based on schedule availability	Conduct the pre-test HIV champion provider training assessment to assess the baseline level of knowledge Conduct the HIV champion provider training Conduct the post-test HIV champion provider training assessment to assess the new knowledge learned	Evaluate the results of the pre- and post-test training Evaluate the effectiveness of the training materials used Evaluate the overall training from HIV champion providers

Appendix C3: 4F Screening Diagram

Identify Eligible Patients	Offer 4F Intervention	Schedule 4F Encounter	Conduct 4F Screening and Plan Development	Provide Referrals	Schedule 4F Reassessment
Query EMR for eligible patients Send the list of eligible patients to the project coordinator	Outreach to eligible patient Explain 4F intervention Respond to patient questions Offer 4F intervention Patient accepts intervention	Identify available HIV champion provider appointments Offer available appointments to patient Place 4F encounter in HIV champion provider schedule	Patient registers Send alert to project coordinator & HIV champion provider Conduct 4F assessment Develop a care management plan	Provide referrals Document referrals	Determine next 4F follow-up appointment Schedule patient for 4F follow-up Send alert to project coordinator

Appendix D. Operational Guidance

This appendix provides a site-specific and detailed description of the intervention's procedures to illustrate how the model was implemented in a real-world setting. It offers practical guidance by outlining the operational steps taken at the demonstration site, serving as an example for replication or adaptation in other contexts. For more information on how the intervention was carried out, please contact Lydia Aoun-Barakat at lydia.barakat@yale.edu.

The 4F intervention is designed to be integrated into an annual "wellness" visit within a typical HIV clinic schedule. The HIV champion providers are supported in implementing the intervention with fidelity, with a comprehensive provider training consisting of materials and resources needed to implement the training and a curriculum aimed at building provider capacity to provide appropriate care and treatment services to persons with HIV over the age of 50.

The 4F Champion Provider Training

The 4F HIV champion provider training in geriatric care and the 4F intervention are intended to support HIV primary care providers in conducting the enhanced geriatric screenings and assessments, providing specialized HIV care and treatment to persons with HIV 50 years or older, and implementing the 4F intervention. The 4F provider training is implemented through the following key activities:

- Recruit interested HIV providers to become HIV champion providers.
- Schedule the provider training.
- Prepare for the provider training.
- Conduct the provider training.
- Evaluate the provider training.

4F Provider Training Package: The provider training package is a toolkit of materials and resources to implement the 4F curriculum. Included in the package are:

- PowerPoint presentations for each of the 4F modules:
    - Training Session #1: How to think like a Geriatrician.
    - Training Session #2: Polypharmacy
    - Training Session #3: Fall risk and Fragility fractures
    - Training Session #4: Live Gait and Balance Session
    - Training videos for all four topics (in development).
- Educational session on how to use the assessment tool in EHR.
- Tip sheet **(Appendix B4).**
- Educational videos to be provided to patients-
    - Fall prevention.
    - Basic exercises.
    - Advanced exercises.

- Polypharmacy for patients.
- Nutrition- Vitamin D and Calcium: in progress.
- Healthy eating: in progress.

- Educational material to be provided to patients, available in EHR:
  - Calcium-rich diet
  - Calcium and vitamin D for bone health
  - Getting up from a fall
  - Preventing falls in adults – Basics
  - Preventing falls in the older adults
  - Fractures – The Basics
  - Osteoporosis- The Basics.

The 4F Assessment Wellness Visit

The 4F wellness visits are carried out by a clinic of trained HIV champion providers to provide individualized screening and care management to meet the unique needs of people 50 years of age or older with HIV and focus on the 4F (Polypharmacy, Falls, and Fragility Fractures). The appointments are scheduled for 60 minutes within the schedule of each HIV champion provider. Each HIV champion provider can offer their own patient aging with HIV to schedule an annual wellness visit, or the clinic coordinator can run a monthly report listing patients 50 years of age and older to identify and engage them to schedule the wellness visit with their provider. The steps below describe the key activities within the specialized geriatric wellness visit.

Client Arrival

1. The client arrives at the clinic for a scheduled 4F wellness visit.
2. The client checks in with the scheduler.
   a. The scheduler opens the scheduling platform.
   b. The scheduler confirms the client's arrival for the scheduled 4F wellness visit appointment.
3. The scheduler invites the patient to sit in the waiting area while the team is notified of their arrival.
4. The nurse/ambulatory care assistant (ACA) greets the client in the waiting room and brings them back to their exam room for the 4F wellness visit encounter.

Client Rooming

5. The nurse/ACA conducts the vitals, orthostatic check, and pain score.
6. The nurse/ACA notifies the provider that the client is ready via the EHR green color dot.

4F Assessment

7. The HIV champion provider greets the client, explains the purpose of the 4F intervention, and responds to any client questions. **(Visit Checklist: Appendix B5)**.
8. The HIV champion provider explains the first elements of the screening as follows:

"We will begin the visit with a series of screenings aimed at evaluating key aspects of your health that are important for maintaining a healthy and independent life as you age. We will begin with a review of the current diagnosis and medications."

9. The HIV champion provider conducts the 4F Assessments in EHR.

PHQ-2 **(Appendix A4),** GAD-7 (**Appendix A2),** and AUDIT- C **(Appendix A8)**

10. These are standard tools available within EHR.

Mental Health **(Appendix A5)**/Physical Health **(Appendix A6)**/Substance Abuse Diagnoses **(Appendix A7)**

11. The HIV champion provider conducts the Mental Health/Physical Health/Substance Abuse Diagnoses using the Mental Health/Physical Health/Substance Abuse Diagnoses Screening Tool.

Polypharmacy/Medication Reconciliation **(Appendix B2)**

12. The HIV champion provider conducts the polypharmacy/medication reconciliation using the polypharmacy/medication reconciliation screening tool.

Sleep Quality Assessment **(Appendix A10)**

13. The HIV champion provider conducts the Sleep Quality Assessment using the Sleep Quality Screening Tool.

Osteoporosis Screening **(Appendix A11)**

14. The HIV champion provider conducts the osteoporosis screening using the Osteoporosis Screening Tool.

Fall Risk Questionnaire **(Appendix A12)**

15. Questionnaire:

Have you slipped or tripped in the past 12 months?	Yes/No
Did this fall result in you hurting yourself?	Yes/No
Have you had a serious fall (a fall for which you went to see a provider – either in clinic or in the emergency room) within the last 12 months?	Yes/No

Do you use an assistive device for walking?	Yes/No
How often do you need physical assistance with standing or walking?	Never, sometimes, often, always
Do you have throw rugs in your home?	Yes/No
Are there obstacles that you need to walk around in your home?	Yes/No
Do you have a slippery tub/shower floor?	Yes/No
Do you have lights on the path from your bed to the bathroom?	Yes/No

Fragility Fracture Risk Questionnaire and Calculator **(Appendix A17)**

16. The HIV champion provider conducts the Fragility Fracture Risk Questionnaire using the Fragility Fracture Risk Screening Tool and Calculator.

    FRAX Score Calculator

What Matters Most Question **(Appendix A14)**

17. The champion provider asks the "what matters most" question to the client.

Footwear and Foot Exam **(Appendix A13)**

18. The HIV champion provider assesses the client's Footwear and conducts the Foot Exam.

Vision Exam **(Appendix A15)**

19. The HIV champion provider walks the client to the hallway outside the exam rooms and conducts the Vision exam using a traditional eye chart, eye cover, and pointer at a 20ft testing interval for the client.

Gait Assessment **(Appendix A16)**

20. The HIV champion provider walks the client from the vision exam chart area back to the exam room while they conduct the gait assessment using the Gait Assessment Screening Tool.

Client Care Plan

21. The HIV champion provider brings the client back to the exam room and discusses a summary of findings and the care plan, follow-up, and referral.
22. The HIV champion provider provides the client with a link to appropriate educational videos and printed handouts.

Client Brought to the Blood Draw Room

23. Nurse/ACA brings the client and draws the client's blood based on the labs requested by the HIV champion provider **(Appendix B3)** (recent labs within the last 6 months do not need to be repeated).

Client Brought to the Front Desk for Check-Out and one-year Follow-up Scheduled

24. Once the blood draw has been completed. The nurse/ACA walks the client back to the front desk for check-out.
25. The scheduler at the front desk checks out the client and schedules the one-year follow-up appointment.

Provider Referrals

Send referral guidelines to specialist.

Schedule 4F reassessment.

One-year follow-up is scheduled at the end of the first 4F screening encounter. One-year follow-up will follow the same procedures as the first 4F screening encounter.