Pharmacists: Partners in Health Care for HIV-Infected Patients

I. Introduction

A patient's understanding of the role of antiretroviral (ARV) therapy, the use of pharmacologic agents that specifically inhibit HIV replication, and the importance of adherence to prescribed medications are fundamental to the effective management of HIV infection. Patients ultimately determine whether they will fill a prescription, take it as prescribed, or discontinue a medication due to a side effect, complication, or other reason. Pharmacists have the opportunity to educate patients about the safe and appropriate use of medications and should provide ongoing education to patients to ensure successful treatment with HAART. An open, trusting, nonjudgmental relationship between the pharmacist and patient can empower patients with the knowledge and skills needed to effectively manage their disease.

II. Confidentiality

Patient confidentiality should be maintained at all times. A private area designated for patient counseling sessions will foster an environment that encourages an open dialogue between the pharmacist and patient.

All pharmacy staff should be aware of and comply with the Federal Health Insurance Portability and Accountability Act (HIPAA) to ensure patient confidentiality. HIPAA regulations allow information to be exchanged among healthcare providers if it is needed for treatment, payment, or healthcare operations. Further mention of communication between and among pharmacists and other healthcare providers and patients in this document assumes strict compliance with the HIPAA regulations. More information about HIPAA can be found at: www.health.state.ny.us/nysdoh/hipaa/hipaa.htm

Pharmacists in New York are required to receive training in, and comply with, New York State Public Health Law article 27-F, which also regulates how HIV-related information about testing, counseling, and partner notification may be transmitted. Pharmacists should comply with this law to the fullest extent.

III. Contributions to HIV Management

As partners in the treatment of people with HIV infection, pharmacists play an important role in ensuring effective medical care. The following are some of the areas where pharmacists can contribute to the management of HIV-infected patients.

A. Education

The management of HIV infection is evolving at a rapid pace. With the approval of each new ARV agent comes the responsibility of knowing the correct use of the agent and any side effects and interactions that have been reported with its use. The best way for pharmacists to stay abreast of the changes in HIV treatment and ARVs is through education. Pharmacists in NYS are required to take 15 continuing education credits a year and pharmacists with HIV-infected clients should receive some of those credits in HIV-related care. The following are several of the resources that can be consulted for HIV educational management:

- Pharmacists Society of the State of New York (PSSNY, http://www.pssny.org)
- RxSchool (http://www.rxschool.com)
- New York State Council of Health System Pharmacists (NYSCHSP, http://www.nyschp.org)

Pharmacists and clinicians should know how to access accurate and updated information. Listed in Appendix A are some of the available resources, including guidelines for treating HIV, current clinical trials, drugs that interact with ARV agents, metabolic and morphologic complications associated with ARV therapy, and HIV drug resistance.

Key Point:

Keeping up-to-date with HIV management and ARVs will help pharmacists provide the best information to HIV-infected patients and help prevent medication errors.

Adequate time is needed to educate the patient about the goals of therapy and the need for strict adherence due to the complexity of HIV disease, the need for long-term potent combination ARV therapy, and the potential for developing ARV resistance. These educational sessions are essential upon initiation of therapy, but should also take place frequently throughout the treatment course.

Various HIV-related patient education aids are available for distribution to patients. Because of the rapid changes that occur with ARV doses and combinations, every attempt should be made

to ensure that these patient education tools are updated as necessary. Personalized education materials may be developed where necessary, using language that is easily understood by the patient, culturally sensitive, consistent with the patient's level of education, and free of medical jargon.

1. Key Points to Communicate to Patients

Pharmacists should discuss HIV management with patients, even if it duplicates the prescribers' discussions. Visual aids can be used to demonstrate the relationship between poor medication adherence and ARV resistance to help patients understand the importance of taking their HAART regimens as prescribed. Pharmacists should help patients understand that poor adherence leads to higher viral load, which increases HIV transmission potential.

Key Point:

One way to ensure that a patient understands his/her drug regimen is to have the patient repeat back to the pharmacist the instructions for taking medications.

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a. Adherence

Adherence to complex medication regimens is difficult for many patients, not only those with HIV infection. Some patients may be more comfortable discussing adherence problems with their pharmacists than with their clinicians. When this occurs, the pharmacist can contact the prescriber to discuss strategies to improve adherence.

Adherence to HAART is one of the most important aspects of HIV care. Pharmacists should counsel patients about the need for strict adherence to their ARV regimen because it is necessary for maintaining treatment benefit and preventing the development of HIV resistance. Regimens that require numerous pills for HIV infection and comorbidities and the adverse side effects associated with HIV treatment have made adherence increasingly difficult. Non-adherence can adversely affect HIV outcomes and increase the rate of progression to an AIDS-defining illness and increase HIV-related mortality.

Some patients may need more support the longer the duration of therapy because of "pill fatigue" leading to diminished adherence.

Key Points:

- **Pharmacists should counsel patients receiving ARV therapy about the need for strict adherence and the risk of viral drug resistance when adherence is compromised.**
- **Pharmacists should assess patient adherence by using finite time intervals when inquiring about the patient's self-reported adherence (i.e., number of doses taken and missed in the past day and past week).**
- **Pharmacists should offer adherence tools, such as pillboxes, beepers, and reminder phone calls, to all HIV-infected patients receiving HAART.**
- **Pharmacists are encouraged to contact prescribers when they identify patients who are non-adherent to HAART.**

Patients should be counseled that taking HAART medications <95% of the time can significantly increase their chances of developing resistance. Of greater importance is when patients improve their rates of adherence without achieving ≥95% adherence. For example, if a patient were to improve adherence from 50% to 85%, the risk of developing resistance is great. Even though adherence improved, the level of adherence is still suboptimal and may contribute to developing resistance. When discontinuing ARV medications, patients are generally counseled to discontinue all medications at the same time; however, patients should also be instructed to speak with their prescriber prior to discontinuing any medication.

i. Barriers to Adherence

There are many reasons why patients do not take HAART medications exactly as prescribed. One study found that "the most frequent reasons for at least 'sometimes' missing a dose were eating a meal at the wrong time (38.2%), oversleeping (36.3%), forgetting (35.0%), and being in a social situation (30.5%)."[7] The dosing schedule is the largest obstacle in achieving strict adherence. Other potential barriers are listed in Appendix D.

ii. Assessing Adherence

Strategies used to assess ARV adherence in the outpatient setting include self-report, pill counts, electronic monitoring, pharmacy refill monitoring, therapeutic drug monitoring, directly observed therapy (DOT), and modified directly observed therapy (MDOT). Although each of these methods has been used, advantages and disadvantages are associated with each approach. Table 1 lists some of the common advantages and disadvantages of each method of adherence assessment.

TABLE 1
ADVANTAGES AND DISADVANTAGES TO ADHERENCE MEASURES

METHOD	ADVANTAGES	DISADVANTAGES
SELF REPORT Pharmacists can ask: *How many pills did you miss in the past 3 days?*	Easily completed using patient interview or questionnaire (report of non-adherence is more reliable than report of adherence). Inexpensive.	Overestimates adherence. Correlation is dependent on patient's relationship with staff. Individuals may tell prescribers what they perceive as socially desirable or "right" responses.
PILL COUNTS "Brown bag sessions"	Useful adjunct to self-report. Unannounced pill counts may be more accurate. Direct costs minimal.	Tends to overestimate adherence due to pills being "dumped" prior to visit. Casts prescriber in the role of medication monitor and not ally or advocate. Indirect costs a concern due to time constraints. Does not prove that patient actually took medication.
ELECTRONIC MONITORING	Medication Event Monitoring System (MEMS) Caps Best correlation with virologic outcomes. Allows more detailed view of non-adherence patterns. Most accurate measure.	Expensive and generally reserved for clinical trials. Precludes use of pillbox. Fails if multiple medications are kept in a single bottle or if multiple doses are taken out at one time. Requires carrying the container.
PHARMACY REFILL MONITORING	Easy, minimal time commitment. Timely refilling of prescriptions correlates well with adherence. Most successful when limited to patient using one pharmacist. Is a useful adjunct to self-report.	Does not equate with medication-taking. Patients may use more than one pharmacy. Medication may be shared or sold.

THERAPEUTIC DRUG MONITORING	Confirms patient reporting.	Pharmacokinetic levels for most drugs have not been well established. Only confirms the pre-measurement adherence, long-term adherence still unknown.
HEMATOLOGIC MONITORING USING EITHER COMPLETE BLOOD COUNTS OR EXPANDED CHEMISTRY PANELS	Confirms patient reporting.	Only effective for certain drugs: Zidovudine, stavudine – increased MCV. Indinavir – increased bilirubin. Not always reliable.
DIRECTLY OBSERVED THERAPY (DOT)	100% adherence in theory. Ideal method for institutional settings (prisons, nursing homes, etc.).	Labor intensive. Not practical for complex regimens with multiple doses and/or dietary restrictions.
MODIFIED DIRECTLY OBSERVED THERAPY (MDOT)	100% adherence in theory. Ideal method for ambulatory settings. Assumes patient takes all non-monitored drugs correctly.	Labor intensive. Concern for development of resistance if plan not followed.
VIRAL LOAD	Can correlate with adherence. Although poor adherence is associated with virologic failure, not all individuals with virologic failure will be poor adherers.	Does not necessarily indicate non-adherence. May overestimate adherence. Virologic failure can be indicative of drug resistance.
PRESCRIBER ESTIMATION	None.	Prescriber estimation is most poorly correlated with actual adherence.

iii. Language and Culture

Attention to language and use of culturally sensitive education materials is essential. Many HIV-infected people living in New York speak English as a second language or do not speak English at all. Pharmacists should make every attempt to communicate with patients in the language that is most comfortable to the patient. Using multilingual staff and providing written materials in the language that is most prevalent in the service population is a welcoming sign and may encourage a more trustworthy atmosphere between pharmacists and patients.

Culture and religious beliefs may affect the health behaviors of HIV-infected patients. When patients do not believe that their medications will treat their infection, they are less likely to adhere to their regimens. Traditional remedies may be preferred and used instead. Patients may be more comfortable discussing the use of traditional remedies with their pharmacist than their prescriber. Pharmacists should explain, in a culturally sensitive and nonjudgmental manner, the benefits and risks of not taking medications as prescribed and the possible effects of using other remedies to treat HIV infection.

Use of the following, specific to language barriers, may facilitate adherence.

- Local hospital language banks.
- Signs in languages other than English.
- Multilingual staff.
- Written materials, in as many languages and reading levels as applicable.
- Sign language interpretation for deaf patients.
- Large print materials.

When low literacy levels may be an issue, pharmacists should consider:

- Reviewing written materials with each patient.
- Providing patients with pictorial or verbal information.

- Using medication stickers.

b. Side Effects and Toxicities

Adverse effects from ARV drugs, such as nausea, diarrhea, and rash, are common among patients receiving ARV therapy. HIV-infected patients often take other medications for the prophylaxis of opportunistic infections and for other comorbidities. These additional drugs may increase the adverse effects of the ARV drugs. Patients may not adhere to their regimen if adverse effects are not adequately managed or alleviated.

The pharmacist should educate the patient about potential drug toxicities, assess for the presence of any adverse effects, and assure the patient that these toxicities are being monitored and addressed by their prescriber. Pharmacists routinely make recommendations regarding management of side effects with over-the-counter and non-drug interventions, such as taking medications with food if the medications irritate an empty stomach, or drugs that may cause drowsiness at bedtime. In an effort to avoid premature discontinuation of an ARV agent, the patient should be informed that many toxicities subside after a few weeks of initiating therapy. Before discontinuing HAART, the patient should be advised to call their prescriber and discuss any adverse effects they are experiencing.

c. Review of Medication Profile

A hallmark of effective HIV patient care is providing consistent, coordinated care among all providers. Accurate documentation of patient visits with the pharmacist is a crucial link to meeting this objective. Two key aspects to providing high quality care are asking insightful questions and properly documenting responses. To accomplish these objectives, a consistent, comprehensive procedure should be followed. Using an algorithm (Appendix B) can help to ensure that no steps are missed when documenting patient encounters such as a reminder phone call for refills.

At every visit to the pharmacy, the patient's medication profile should be reviewed for new drugs (including over-the-counter medication and herbal/alternative therapies),

medication changes, missed refills, and medication-related problems. If the pharmacist has questions about a patient's medication profile that the patient cannot explain, the prescriber should be contacted for clarification.

i. New Prescriptions

The following list includes essential patient counseling points for all new prescriptions:

1. Name of medication (brand name and generic name)
2. Purpose of medication
3. Strength of medication
4. Dose (number of tablets, capsules, etc.)
5. Frequency
6. Food requirements/restrictions
7. Common side effects/toxicities
8. Storage
9. Missed dose instructions
10. Special instructions (including potential for drug interactions)
11. Under what circumstances to call patient's prescriber

ii. Current HAART Regimen

For patients who have been taking the same regimen for some time, using open-ended questions to assess their knowledge base may be a more effective way to determine areas where more education is needed. Questions such as the following may be helpful:

- *What medications and doses are you taking?*
- *What time of the day do you take your medication?*
- *What do you do when you miss a dose?*
- *What kinds of problems are you having with your medication?*

iii. Written Medication Schedule

Some patients may benefit from a written medication schedule tailored to their particular regimen. The pharmacist can help patients determine the most appropriate times to take their medication while considering the patient's daily routines, drug-food interactions, and potential drug-drug absorption related interactions. Stickers with pictures of ARV agents (see Appendix C) may help patients who have difficulty remembering drug names and distinguishing between drugs to remember to take their medications correctly and on schedule.

iv. Refills

Patients should be encouraged to refill all ARV prescriptions at the same time because this has been found to reduce the number of missed doses, thus, improving patient adherence. Patients receiving other medications for comorbidities should be encouraged to have those prescriptions refilled at the same time as the ARV prescriptions. By evaluating patient refill histories, pharmacists may be able to provide an accurate measure of adherence to the prescriber.

Patients may receive new prescriptions at different times of the month. When this occurs, the quantity dispensed on the new prescription should be adjusted so that the new prescription's refill will coincide when other prescriptions are due to be refilled. This can be accomplished by the pharmacist by placing a call to the prescriber to obtain a verbal prescription for the quantity on the new prescription to accommodate only the number of pills needed to the next "refill cycle" on the other prescriptions. Because Medicaid does not require a written prescription for any prescription with no refills (other than controlled substances), no further action is required of the prescriber. The written prescription can then be filled with the next monthly cycle.

Example: A patient has 4 prescriptions filled on the 10th of the month (for a 30 days supply), on the 27th day of the month, the patient presents a new

prescription for a 30-day supply of another drug, with 5 refills. The pharmacist can call the prescriber, get a verbal prescription for a 13-day supply of the new drug, and fill the written prescription on the 10th of the next month with all the other prescriptions. The pharmacist should tell the prescriber why this is being done for the patient — to simplify the patient's regimen and decrease missed doses and missed refills.

B. Review of Prescriptions and Prevention of Medication Errors

To ensure accurate dispensing of medications, pharmacists should review any dosage adjustments, formulation changes, and drug substitutions with the patient's prescriber. Medication prescribing errors are likely to occur with HIV medications because of the complex nature of HAART regimens. Patients often receive other agents to treat or prevent opportunistic infections and other comorbidities, which increases the risk of medication errors and drug interactions, including food-drug interactions (See the *Drug-Drug Interactions* chapter in the *Criteria for the Medical Care of Adults With HIV Infection*, also available at www.hivguidelines.org). Prescribing errors can lead to adverse drug events, reduced effectiveness of HAART, and increased morbidity and/or mortality. Types of HIV-specific medication prescribing errors are shown in Table 2.

TABLE 2
TYPES OF HIV-SPECIFIC MEDICATION PRESCRIBING ERRORS

- **Misinterpretation of abbreviations:**
  AZT used for zidovudine
  AZT interpreted as azathioprine

  APV interpreted as ATV if poorly written, as well as the reverse

  ATZ mistakenly written for AZT
  ATZ mistakenly written (for AZT) but interpreted as ATV

- **Misinterpretation of like-sounding medications:**
  Nevirapine (trade name Viramune) and
  Nelfinavir (trade name Viracept)

  Ritonavir (trade name Norvir) and
  Retrovir (generic name zidovudine)

C. Strategies to Prevent Medication Errors

Abbreviations can cause unintended consequences or adverse events if misinterpreted. Pharmacists should clarify prescriptions that contain abbreviations and discourage their use by prescribers. Pharmacists should also encourage clinicians to write both the generic and brand names on HAART prescriptions to minimize errors related to like-sounding medications.

Hospital pharmacists should review each patient's medication record on a regular basis to detect missing, discontinued, or misspelled orders that could result in medication errors. Pharmacists who screen new orders and discharge prescriptions may also identify and prevent potential errors.

Key Point:

Pharmacists can contribute to the optimal care of patients by encouraging patients to fill prescriptions at one pharmacy.

Patients receiving prescriptions from multiple pharmacies may be at increased risk for unrecognized adverse effects, medication errors, and/or drug interactions. Patients should be encouraged to inform pharmacists and prescribers of all the healthcare providers from whom the patient is receiving treatment to ensure ongoing, proper communication that will help to minimize errors.

Pharmacies use a Drug Utilization Review (DUR) program, a software program that evaluates prescription drug use, physician prescribing practices, or patient drug use, to determine the appropriateness of drug therapy. DUR often focuses on patient overutilization. It can assist in reducing dispensing errors and promote patient safety. If a drug alert appears when the pharmacist enters a prescription into the computer, the pharmacist should consult the patient's provider to discuss the alert. Pharmacists should counsel the patient and not override an alert without first consulting the provider.

IV. Communicating Medication-Related Problems

A. Adverse Effects

HIV-infected patients may see their pharmacists more often than they see their healthcare provider; thus, some patients may initially report problems with side effects to their

pharmacists and not to their prescriber. Pharmacists can contact the patient's prescriber when the patient reports difficulties with medication side effects that the patient has not discussed with the prescriber. This provides an opportunity for the prescriber to become aware of the adverse effects and for the pharmacists to advise prescribers on the management of these ill effects.

B. Drug-Drug Interactions

Drug interactions have become an increasingly complex challenge in the management of HIV-infected patients. Pharmacists are knowledgeable about the potential for and severity of drug interactions. In the management of the HIV-infected patient, drug interactions are particularly important because some ARV medications are often used to boost drug regimens, as in the use of ritonavir to boost indinavir or saquinavir. However, because multiple drugs are used to comprise a regimen, the potential for adverse drug interactions is great. Pharmacists are at the forefront for alerting and educating healthcare providers about known adverse interactions. For further information on drug-drug interactions, refer to the *HIV Drug-Drug Interaction* chapter in the *Criteria for the Medical Care of Adults With HIV Infection* manual, also available at: www.hivguidelines.org.

C. Co-Infections

Many HIV-infected individuals are co-infected with hepatitis B and C. In patients with chronic hepatitis and significant liver dysfunction, certain medications should be avoided or doses should be adjusted according to the extent of liver damage. Most prescribers will separate combined-dose medications to individual medication doses when the combined dose is contraindicated, e.g., Combivir and Trizivir should not be used in patients with renal insufficiency; the components should be separated and the dose adjusted. However, if an adjustment is not made, the pharmacist should contact the prescriber to discuss alternatives to using combined-dose medications. Pharmacists can educate prescribers about the precautions with medications for co-infections. For further information on managing the hepatitis/HIV co-infected patient, refer to the *Viral Hepatitis* chapters in the *Criteria for the Medical Care of Adults With HIV Infection* manual, also available at: www.hivguidelines.org.

V. ARV-Related Morbidity

Lipodystrophy, metabolic acidosis, new-onset diabetes mellitus, hypertension, and dyslipidemias are common comorbidities that occur with the use of ARV therapy. The development of these complications, especially if patients are not informed in advance, may lead to non-adherence to medication regimens. Pharmacists can contribute to the careful pharmacologic and dietary management that is required for the treatment of multiple diseases and disorders and can work with prescribers on the prevention and management of ARV-related morbidity.

Certain ARV drugs have been associated with particular side effects and complications, as shown in Table 3.

TABLE 3
DRUGS ASSOCIATED WITH ARV-RELATED SIDE EFFECTS AND COMPLICATIONS

SIDE EFFECT	ARV DRUG ASSOCIATED WITH SIDE EFFECT
Bone Marrow Suppression	Zidovudine
Pancreatitis	Didanosine (tenofovir increases the levels of didanosine, thereby increasing the risk of pancreatitis. Adjust didanosine dose with tenofovir co-administration.)
Hepatotoxicity	All ARV agents, but full-dose ritonavir (600 mg twice daily) has been associated with worsening transaminase in patients with pre-existing liver disease
Renal Toxicity	Indinavir (especially when used with ritonavir) Tenofovir
COMPLICATION	**ARV DRUG ASSOCIATED WITH COMPLICATION**
Disorders of Glucose Metabolism	Protease inhibitors (PIs; especially indinavir) Nucleoside and nucleotide reverse transcriptase inhibitors (NRTIs, NtRTIs), possibly
Lipid Abnormalities (Dyslipidemia)	PIs NNRTIs Ritonavir
Body Fat Changes	
• Fat loss, or lipoatrophy	NRTIs
• Fat gain, or lipohypertrophy	PIs
• Lipoatrophy	Stavudine
Lactic Acidosis (rare)	NRTI use, especially with regimens that include stavudine, didanosine, or zalcitabine
Osteopenia/Osteoporosis	PIs NRTIs

VI. Financial Assistance for Patients with HIV/AIDS

A. ADAP/ADAP Plus

AIDS Drug Assistance Programs (ADAPs) were developed to help states pay for prescription coverage for the growing number of people infected with HIV who were not covered by Medicaid or private insurance. The Ryan White Care Act established three programs to give HIV-infected individuals who are uninsured or underinsured access to free health care.

- ADAP - provides free medications for the treatment of HIV/AIDS and opportunistic infections.
- NYS ADAP Plus (Primary Care) - provides free primary care services at selected clinics, hospital outpatient departments, office-based physicians, and laboratory vendors.
- NYS HIV Home Care - provides coverage for home care services to chronically medically dependent individuals as ordered by their physician.

The ADAP Helpline is 1-800-542-2437. The ADAP Program Summary is available at: www.health.state.ny.us/diseases/aids/index.htm

B. Patient Assistance Programs

Many drug manufacturers have instituted Patient Assistance Programs to help patients with HIV/AIDS who are having financial difficulty obtaining needed medications. Pharmacists can contact each company individually to inquire about their Patient Assistance Programs.

VII. How to Service Patients Pending Medicaid Eligibility To Minimize Pharmacists' Financial Exposure

- **Accept only patients from a dedicated referral source. A dedicated referral source is an entity with which you have an ongoing relationship; it could be a doctor's office, a hospital-based clinic, a CBO, etc.**
  Reason: possible financial loss.
- **Accept only patients working on obtaining Medicaid through the facility's social services department or some other source where you can verify that the necessary paperwork/documentation has been, or will be, submitted to the Department of Health (DOH).**
- **Obtain date patient applied for Medicaid.**
  Reason: Most applications take 6 to 8 weeks. If you accept a patient on day one, you must be prepared to carry the patient to the end. Knowing when the patient applied will help you estimate your possible financial exposure.
- **When accepting a Medicaid pending patient, know the therapy.**
  Reason: Enteral formulas (Ensure, Pediasure, Nipro, etc.) cannot be back billed because they require prior approval. Even if the date of eligibility is retroactive, the ability to get a prior approval is not.
- **Accept only a pending patient for medication/supplies.**
  Reason: The patient may become enrolled in a PCP in which you do not participate. If you are not participating, the PCP will not allow you to back bill for home medical equipment or any other goods and services not included in the Medicaid Pharmacy carve-out.
- **When accepting a pending patient, only dispense (when able) a 2-week supply of medication or supplies at a time.**
  Reason: Allows for the opportunity to call the referral source for an update on the patient's status. Also, if a problem occurs in the process, you will know sooner and minimize your financial exposure.

Appendix A

Educational Materials for Pharmacists and Prescribers

A. Publications

Bartlett JG, Gallant JE. *Medical Management of HIV Infection.* Updated annually. Available at: www.hopkins-aids.edu/publications/publications.html Copies can be ordered online.

Becker SL, Hoetelmans MW. *Exploiting Pharmacokinetics to Optimize Antiretroviral Therapy.* Clinical Update, April 2002. Available at: www.medscape.com/viewprogram/703_pnt

Pau AK. *Polypharmacy Problems: Drug Interactions in the Multidrug Therapy of HIV Infection.* The PRN Notebook, March 2002, Vol.7, No.1; 4-9. Available at: www.prn.org/prn_nb_cntnt/vol7/num1/pau_frm.htm

Markowitz MH, Ramratnam B, Louie M. *The Road to Eradication: Is HAART Hard Enough?* The PRN Notebook, Dec, 2001, Vol.6, No.4; 16-19. Available at: www.prn.org/prn_nb_cntnt/vol6/num4/markowitz_frm.htm

Panel on Clinical Practices for Treatment of HIV Infection. *Guidelines for the Use of Antiretroviral Agents in HIV-1 Infected Adults and Adolescents*, DHHS April 7, 2005. Available at: http://aidsinfo.nih.gov/guidelines/default_db2.asp?id=50

Wanke CA, Falutz J, Shevitz A, et al. Clinical evaluation and management of metabolic and morphologic abnormalities associated with human immunodeficiency virus. *Clin Infect Dis* 2002;34:248-259.

Currier JS, Havlir DV. Complications of HIV Disease and Therapy. Topics in HIV Medicine, March/April 2002, Vol. 10, Issue 1; 11-17. Available at: www.iasusa.org/pub/index.html

Wilkin TJ, Hay CM, Hogan CM, et al. Management of Antiretroviral Therapy. Topics in HIV Medicine, March/April 2002, Vol. 10, Issue 1; 18-35. Available at: www.iasusa.org/pub/index.html.

B. Internet Resources for Information about HIV/AIDS

www.hivguidelines.org
A collaborative effort between the New York State Department of Health AIDS Institute and The Johns Hopkins University School of Medicine, Division of Infectious Diseases. Provides state-of-the-art tools to ensure delivery of the highest quality HIV clinical care and contains a section devoted to Best Practices information.

http://hopkins-aids.edu
This Johns Hopkins University AIDS Service site offers sections with information on HIV/AIDS treatment, prevention, and managed care; an interactive question and answer section designed to provide clinicians and patients with the opportunity to draw on the expertise of HIV specialists at The Johns Hopkins AIDS Service by posting questions that will be answered on-line.

www.medscape.com
This Medscape site *provides an interactive tool to check a regimen for multi-drug interactions and generate a daily medication schedule.* Medscape's products and services are designed to give healthcare professionals and consumers the information and digital data they need, regardless of where or when they need it. From traditional applications to web-based services to mobile computing devices, Medscape provides the leading digital health record and the best on-line healthcare information in a variety of formats. (www.medscape.com/druginfo/druginterchecker?cid=med).

http://hiv.buffalo.edu/
The HIV Pharmacotherapy Network's pharmacotherapy section offers information on ARV medications, pharmacokinetics and pharmacodynamics, therapeutic drug monitoring, ARV toxicity, medication scheduling and adherence, and more.

www.aidsmap.com
The National AIDS Manual (NAM), in collaboration with the British HIV Association, produces this site. NAM is a community-based information organization that produces extensive information on treatments, both in book form and as a searchable database on its website. One of the key site features is the **Personal Pill Planner**, which helps individuals figure out the best time to take a particular regimen based on lifestyle patterns.

www.amfar.org/cgi-bin/iowa/index.html
The American Foundation for AIDS Research (amfAR)'s HIV/AIDS Treatment Directory is a comprehensive, continually updated, searchable database of clinical results for approved and experimental treatments for HIV and HIV-related conditions and infections, as well as protocol information and locations of actively recruiting clinical trials.

www.cdcnpin.org/scripts/index.asp
The CDC National Prevention Information Network (NPIN) provides information about HIV/AIDS, sexually transmitted diseases (STDs), and tuberculosis (TB). All NPIN's services are designed to facilitate the sharing of information about education, prevention, published materials, and research findings and news about HIV/AIDS-related, STD-related, and TB-related trends.

www.hivandhepatitis.com/index.html
An online publication that provides information about treatment for HIV/AIDS, chronic hepatitis B and hepatitis C, and co-infection with HIV/HCV and HIV/HBV. The site also provides a chart of current and investigational drugs used to treat hepatitis and posted reports of Conferences for AIDS-and hepatitis related research.

www.aidsinfo.nih.gov/
USDHHS HIV/AIDS Treatment Information Service site serves as a central resource for federally approved treatment guidelines for HIV and AIDS for the following: Adults and Adolescents, Pediatrics, Perinatal, Healthcare Worker Exposure, Non-occupational Exposure, Tuberculosis, and Opportunistic Infections.

www.hiv-druginteractions.org/
The University of Liverpool HIV Pharmacology Group's site contains HIV-drug interaction charts, which allow selection of and detailed information on the predicted results of specified multiple drug combinations and, where appropriate, recommendations for dosing medications. The site also provides articles and presentations that focus on the pharmacokinetics of ARV agents.

www.hivresistanceweb.com/index.shtml
HIVresistanceWeb provides new information, practical knowledge, and opinion on the rapidly evolving issues that surround ARV drug resistance.

C. State Pharmacy Societies

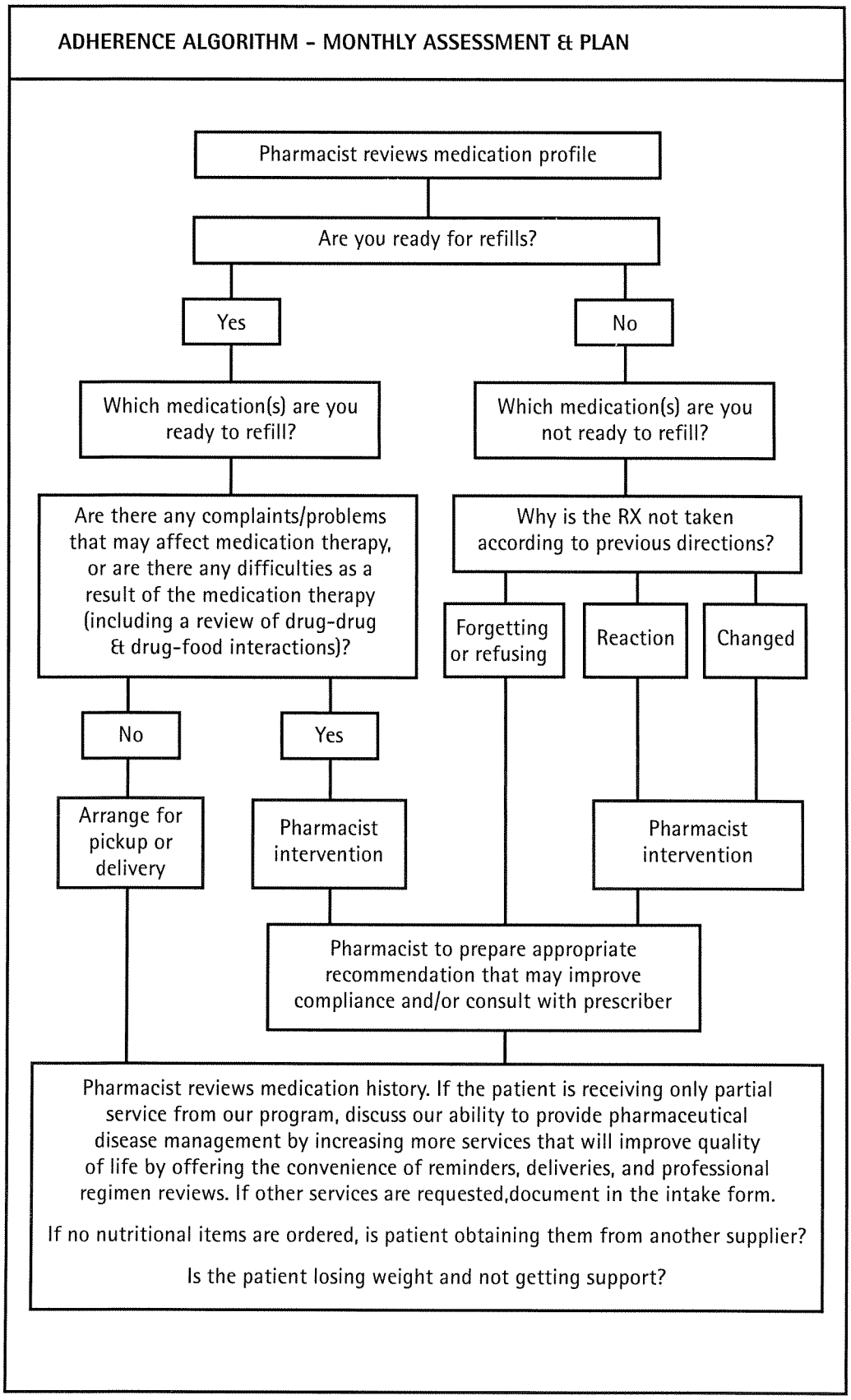
For additional information about educational resources, pharmacists can contact one of three State associations.

www.pssny.org/index_new.htm
Pharmacists Society of the State of New York

www.nysaccp.org/
New York State Chapter of the American College of Clinical Pharmacy

www.nyschp.org/
New York State Council of Health-System Pharmacists

Appendix B


ADHERENCE ALGORITHM - MONTHLY ASSESSMENT & PLAN
Pharmacist reviews medication profile
Are you ready for refills?
Yes
No
Which medication(s) are you ready to refill?
Which medication(s) are you not ready to refill?
Are there any complaints/problems that may affect medication therapy, or are there any difficulties as a result of the medication therapy (including a review of drug-drug & drug-food interactions)?
Why is the RX not taken according to previous directions?
Forgetting or refusing
Reaction
Changed
No
Yes
Arrange for pickup or delivery
Pharmacist intervention
Pharmacist intervention
Pharmacist to prepare appropriate recommendation that may improve compliance and/or consult with prescriber
Pharmacist reviews medication history. If the patient is receiving only partial service from our program, discuss our ability to provide pharmaceutical disease management by increasing more services that will improve quality of life by offering the convenience of reminders, deliveries, and professional regimen reviews. If other services are requested,document in the intake form.
If no nutritional items are ordered, is patient obtaining them from another supplier?
Is the patient losing weight and not getting support?

Appendix C

ARV Medications

The agents used to treat HIV infection belong to four distinct classes of drugs: the nucleoside and nucleotide reverse transcriptase inhibitors (NRTIs, NtRTIs), the non-nucleoside reverse transcriptase inhibitors (NNRTIs), the protease inhibitors (PIs), and the fusion inhibitors (FIs).

ARV therapy is always designed to attempt to achieve the maximal possible suppression of viral replication. Such suppression requires three or more agents. In ARV therapy-naïve patients, at least two agents are usually NRTIs. The third may be a PI or an NNRTI. The combination of three NRTIs has been shown to have higher virologic failure; hence, use of triple NRTI regimens or two NRTIs and an NtRTI is not recommended at this time. Therefore, acceptable configurations for initial firstline ARV therapy are:

- 2 NRTIs + 1 PI (with or without ritonavir boosting)
- 2 NRTIs + 1 NNRTI
- 1 NRTI + NtRTI + 1 PI
- 1 NRTI + NtRTI + 1 NNRTI
- 1 NRTI + NNRTI + 1 PI

Subsequent regimens are generally more complex and will depend on ARV history and genotype. Pharmacists are encouraged to the check with the above reference or call the prescriber to confirm a complex antiretroviral regimen.

For current New York State Department of Health recommended combinations of ARV therapy, see *Antiretroviral Therapy* at www.hivguidelines.org. The US Department of Health and Human Services (DHHS) lists their recommendations at: http://aidsinfo.nih.gov/guidelines/adult/AA_102904.pdf

Pictures of ARV medications will be posted as soon as they are available.

Appendix D

TABLE D-1
BARRIERS TO ADHERENCE

- Poor patient-prescriber communication.
- Communication difficulties that arise when the patient's attitude about disease and therapy is different from that of the prescriber's. Without open and nonjudgmental communication from the healthcare team, patients may not trust or may misunderstand the prescribed regimen.
- Language or literacy barriers.
- Unstable living situations.
- Lack of social support.
- Concerns regarding disclosure of HIV status, which may become known when medications are taken.
- Inability to set long-term goals.
- Inadequate knowledge about disease and effectiveness of medications.
- Patient's lack of belief in his/her ability to take medications regularly.
- Problems obtaining housing, food, childcare, or other immediate life needs, which are viewed as more pressing than taking the medications regularly.
- Active drug use.