

## Supplementary Online Content

Günthard HF, Saag MS, Benson CA, et al. Antiretroviral drugs for treatment and prevention of HIV infection in adults: 2016 recommendations of the International Antiviral Society–USA Panel. *JAMA*. doi:10.1001/jama.2016.8900

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This supplementary material has been provided by the authors to give readers additional information about their work.

## **eAppendix. Recommendations Development Process**

### **I. Brief Summary**

The recommendations for antiretroviral therapy in adults with HIV infection recommendations were developed by an international panel of experts in HIV research and patient care. The Panel was established initially in 1995 by the International Antiviral Society–USA (IAS–USA)<sup>1</sup>; members are selected by the IAS–USA Board of Directors and vetted by the organization for suitability for the panel. Panel members serve in a volunteer (uncompensated) capacity and do not participate in industry promotional activities such as speakers' bureaus, lectures, or other marketing activities during their tenure on the panel. Members of the current panel convened in person and by conference calls from 2015 to mid-2016. The chair (Huldrych F. Günthard, MD) oversees the discussions of the process and evidence review and manuscript development, and guides the group to consensus. Section leaders (eBox 3) and teams were appointed to evaluate evidence and summarize panel discussions for each section. Prior to selection of the section teams and leaders, panel members declared their financial relationships with commercial concerns, discussed potential conflicts of interest (COIs), and recused themselves from serving as section leaders or team members as necessary.

Evidence considered for updating the recommendations was limited to data published in the scientific literature, presented at major peer-reviewed scientific conferences, or released as safety reports by regulatory agencies or data safety and monitoring boards, since the last update in 2014 through June 2016.<sup>2</sup> Literature searches were conducted by a systematic review methodologist at the University of California San Francisco. The publication list was reviewed by a panel member (Paul A. Volberding, MD) for relevance. Approximately 320 citations were ultimately identified from an initial list of more than 3200 in the initial search strategy. Relevant abstracts publically presented at recent scientific conferences were identified by panel members. Manufacturers of antiretroviral drugs were asked to submit lists of relevant publications or abstracts meeting the established criteria. All reference lists, published papers, abstracts, and other relevant reports were organized and stored on a web-based, shared, electronic drive to which all panel members have ongoing access.

These recommendations focus on HIV-1–infected adults in international, developed-world settings where antiretroviral drugs are generally available (approved by regulatory bodies or in expanded access) or in late-stage development (new drug application filed). Recommendations were made by full-panel consensus and rated according to the strength of the recommendation and the quality of the supporting evidence (Manuscript Table 1). For areas in which recommendations have not changed substantially or no or few new data are available, the reader is referred to the previous report.<sup>3</sup>

### **II. Detailed Summary**

#### **a. Background**

The medical management of HIV changes rapidly, owing to the continued rapid advances in pathogenic and clinical knowledge leading to necessary changes in patient care, as well as ongoing availability of new drugs, formulations, and laboratory testing to optimally manage HIV infection. In 1995, on recognizing the rapidly changing knowledge base, the complexity of HIV management and expertise needed to provide quality care, and the lack of current plans to update any existing HIV guidelines, the need to disseminate reliable evidence-based guidance for clinicians involved in HIV management was clear. The IAS–USA Antiretroviral Recommendations Panel was established in 1995 by the IAS–USA to develop this needed guidance for physicians and other clinicians actively involved in HIV care.

## **b. The IAS–USA and Its Role in the Recommendations**

The IAS–USA is a 501(c)(3) not-for-profit, mission-based, nonmembership, educational organization that was established in 1992. The mission of the IAS–USA is to improve the treatment, care, and quality of life for people with HIV, hepatitis C virus (HCV), or other viral infections through high-quality, relevant, balanced, and needs-oriented education and information for practitioners who are actively involved in medical care. The IAS–USA delivers annual continuing medical education (CME) programs on HIV and HCV that include live courses; live intensive, interactive workshops; live webinars; online interactive activities in the series *Cases on the Web (COW)*; and the peer-reviewed, indexed journal *Topics in Antiviral Medicine*.™ In addition, IAS–USA manages and serves as the CME sponsor for the annual Conference on Retroviruses and Opportunistic Infections (CROI), a research conference. The IAS–USA is accredited *with commendation* by the Accreditation Council for Continuing Medical Education (ACCME) to provide CME for physicians.

IAS–USA has sponsored the development of evidence-based recommendations for viral load monitoring, antiretroviral therapy, HIV drug resistance testing, cytomegalovirus (CMV) infection, and the metabolic complications of antiretroviral therapy, all of which are published in the medical literature.<sup>1,3-19</sup> In addition to the published recommendations, the IAS–USA served as the collaborating partner for the American Association for the Study of Liver Diseases (AASLD)/Infection Diseases Society of America (IDSA)/IAS–USA HCV Guidance ([www.HCVguidelines.org](http://www.HCVguidelines.org)) from its inception until January 2016.

The volunteer members of the IAS–USA Board of Directors (eBox 1) oversee the development of the information and educational programs and are not compensated for their roles in oversight and governance of the organization.

IAS–USA funding comes from a variety of sources. Largest single source of revenue is conference and CME participant registration fees. Other funding sources include grants from the pharmaceutical/diagnostics (commercial) industries, grants and subcontracts from government agencies, private donations, and gifts-in-kind from local community businesses and individuals. The commercial support that IAS–USA accepts is only for selected activities. Two large national CME efforts (one on HIV and another on HCV) invite funding in the form of educational grants from industry. Per IAS–USA policy, any effort that uses commercial grants must receive grants from several companies with competing products. Funds are pooled and distributed to activities within the effort at the sole discretion of the IAS–USA. Funders have no input into any activity, including its content, development, or selection of topics or speaker(s). Funders are listed in each activity as applicable.

The development of the Antiretroviral Therapy Recommendations is supported and funded by the IAS–USA. The IAS–USA determined the need for updated recommendations; selected panel members based on expertise in research and care to represent developed-world settings affected by HIV disease; determined the most appropriate way in which to disseminate the information (eg, publication in a medical journal rather than publication in the IAS–USA journal, web publication, etc); and provided administrative oversight and financial support.

The Panel itself is responsible for proposing the design and conduct of the work; collection, management, analysis, and interpretation of the data; and preparation, review, and approval of the manuscript. IAS–USA provided staff support for administrative management, oversight of literature searches and editorial and production assistance. At least one member of the Board serves in each panel to ensure continuing with the IAS–USA mission.

## **c. Identifying and Screening Panel Members**

The panel was initially appointed in 1995, and members have rotated periodically since then. In evaluating potential participants for the Panel, the IAS–USA Board considered individuals who 1) are recognized as authorities in HIV treatment research and clinical care, 2) have appointments in major medical teaching or research institutions, 3) have a demonstrated ability to review and evaluate evidence in an effort to provide useful recommendations in the field, 4) meet the IAS–USA COI and financial relationship criteria for participation (see below and

[www.iasusa.org](http://www.iasusa.org)), and 5) have the ability to work in a collaborative consensus process. In addition, the Board emphasized the need for an international, developed world perspective.

Like the IAS–USA Board of Directors, participants in IAS–USA panels are volunteers and receive no financial compensation for their panel participation. In joining the Panel, members agree to commit substantial time to the effort necessary for evidence review and for participation in the consensus process.

#### **d. COI Management**

It is the policy of IAS–USA to ensure balance, independence, objectivity, and scientific rigor in all its activities. All parties with control over the content of IAS–USA activities are required to disclose to the organization and activity audience any financial interest or other relationship with the manufacturer(s) of any commercial product(s) or provider(s) of commercial services with interests discussed in the activity (eg, presentation, article, etc) within at least the past 12 months. Financial interests or other relationships can include receipt of grants or research support, status as employee or consultant, stock or options holder, paid lecturer, paid lecturer, writer, or author, or member of speakers bureau, of the party or of his or her spouse or partner. The ACCME defines a financial interest as an interest of any dollar amount. Part of the IAS–USA policies to ensure the integrity of its activities is the policy to separate commercial promotion from core IAS–USA educational and informational activities. Individuals who conduct marketing or promotional activities for commercial firms may not contribute to core IAS–USA programs. A marketing or promotional activity includes any activity in which the commercial entity controls key elements, such as speaker or topic selection, that could be used to serve the entity’s commercial interests (eg, speakers bureaus, advertorials, etc). Individuals may not participate in most IAS–USA programs for 12 months after functioning in a promotional or marketing effort for a commercial firm. A notable exception to the separation policy is the annual Conference on Retroviruses and Opportunistic Infections (CROI) which allows research and symposia presentations by individuals with some of such relationships (including employment) because of its large focus on the presentations on original research, if their research or work passes rigorous peer review). Panel members who meet general criteria and are appointed, agree not to participate in any promotional activity on behalf of a pharmaceutical or medical device company (eg, serve on a speaker bureau, as a paid lecturer, or a similar contribution) while a member of the panel. Any conforming financial relationships with commercial entities that still may represent a real or potential COIs, will be resolved so that they do not influence the content of the recommendations. Prior to selection of the section teams and leaders, panel members declared their financial relationships with commercial concerns, discussed potential COIs, and recused themselves from serving as section leaders or team members accordingly.

### **III. The IAS–USA Antiretroviral Recommendations Panel**

The members of the IAS–USA Antiretroviral Recommendations Panel are listed in eBox 2. The Panel convened in person in 2015 to mid-2016, and regularly by conference call. The chair oversees the discussions of the process and evidence review and manuscript development, and guides the group to consensus. Section leaders and teams were appointed to evaluate evidence and summarize panel discussions for each section.

### **IV. Rating the Recommendations**

The Panel is divided by topic into working sections, each with a section leader. These sections are responsible for reviewing and screening evidence, developing preliminary recommendations, and presenting these to the full Panel for discussion, identification of further evidence, and consensus.

The selected rating system (Manuscript eTable 1) combines 2 ratings for each recommendation. One rates the strength of the recommendation (strong, moderate, or limited support) and the other rates the quality of the evidence (ranging from Ia, based on evidence from 1 or more randomized controlled clinical trial[s] published in the peer-reviewed literature, to III, based on the Panel's analysis of the accumulated available evidence).<sup>20</sup>

## **V. Content of the Recommendations**

The Panel agreed on the purpose, audience, and scope of these recommendations and on 8 main content sections (and subsections).

Content Sections:

1. When to Start
2. Recommended Initial Regimens
3. The Interface of Antiretroviral Therapy and Opportunistic Infections
4. When and What to Switch
5. Laboratory Monitoring
6. Engagement in Care and ART Adherence
7. Prevention
8. Future Directions

Panel members were assigned to content sections based on their expertise and section leaders were appointed (eBox 3). The Panel Chair participates in all sections and reviews the entire manuscript, and Paul A. Volberding, MD, reviewed literature search results and identified relevant publications, and also reviewed the entire manuscript.

From 2015 to mid-2016, sections met in person and by conference call and e-mail exchange. Initial discussions were used to develop detailed Section outlines, and assign participants to draft subsections. The full Panel reviewed sections and the final manuscript.

## **VI. Evidence Collection and Literature Searches**

Panel members were selected based on their active work in the field of HIV research and care, and detailed knowledge of available evidence (published and presented at major scientific conferences).

Literature searches in PubMed and Embase were conducted and designed by an expert in systematic reviews, Hacsí Horvath and one of the panel members, Paul Volberding (eTable 1). The initial literature search provided data available since the 2014 publication of the recommendations through April 2016; approximately 320 references were ultimately identified. Relevant abstracts publically presented at recent scientific conferences were identified by panel members. All manufacturers of FDA-approved antiretroviral drugs were asked to submit lists of publications or abstracts meeting the established criteria (eTable 2). Drug manufacturers were instructed to provide references and electronic copies of the published or presented papers or abstracts only and not to comment on the design, methods, results or implications of any of the work. All reference lists, published papers, abstracts, and other relevant reports were organized and stored on a web-based, shared, electronic drive to which all panel members have ongoing access.

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## **eBox 1. Volunteer IAS–USA Board of Directors, June 2016**

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Professor of Medicine  
Co-Director, Center for AIDS Research  
Director, AIDS Research Institute  
Director of Research, Global Health Sciences  
University of California San Francisco  
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Professor of Medicine  
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Director, Antiviral Research Center  
PI/Director, HIV/AIDS Clinical Trials Unit  
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Director, Center for AIDS Research  
Associate Dean for Global Health, School of Medicine  
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Robert T. Schooley, MD  
Professor and Vice Chair of Medicine  
Head, Division of Infectious Diseases  
University of California San Diego  
La Jolla, California

## **eBox 2. IAS–USA Antiretroviral Therapy Recommendations Panel**

Huldrych F. Günthard, MD (Panel Chair)  
Professor of Infectious Diseases  
President of the Swiss HIV Cohort Study  
Deputy Chief, Division of Infectious Diseases and Hospital Epidemiology  
University Hospital Zurich  
Zurich, Switzerland

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Professor of Medicine  
Director, Infectious Disease Training Program  
Director, Antiviral Research Center  
Principal Investigator/Director, HIV/AIDS Clinical Trials Unit  
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Carlos del Rio, MD  
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Rollins School of Public Health  
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\*IAS–USA Board of Directors liaison

### **eBox 3. Working Sections of the IAS–USA Antiretroviral Therapy Recommendations Panel**

#### When to Start

Section Team: Jennifer F. Hoy, MBBS (Leader); Constance A. Benson

#### Interface Between Antiretroviral Therapy and Opportunistic Infections

Section Team: Constance A. Benson, MD (Leader); Jennifer F. Hoy, MBBS; Melanie A. Thompson, MD

#### Recommended Initial Regimens

Section Team: Paul E. Sax, MD (Leader); Rajesh T. Gandhi, MD; Michael S. Saag, MD

#### When and How to Switch

Section Team: Joel E. Gallant, MD, MPH (Leader); Michael S. Saag, MD

#### Laboratory Monitoring

Section Team: Melanie A. Thompson, MD (Leader); Jennifer F. Hoy, MBBS; Constance A. Benson, MD

#### Engagement in Care and ART Adherence

Section Team: Michael J. Mugavero, MD, MHS (Leader); Carlos del Rio, MD; Melanie A. Thompson, MD

#### Prevention

Section Team: Carlos del Rio, MD (Leader); Raphael J. Landovitz, MD

#### Future Directions

Section Team: Joseph J. Eron, MD (Leader); Davey M. Smith, MD

**eTable 1. Summary of Evidence Collection**

Evidence Identification	Number of References From the Initial Search	Number of References Considered Possibly Relevant (Ultimately)	
<b>May 2016 Submission</b>			
Relevant published reports and meeting abstracts <ul style="list-style-type: none"> <li>• Pubmed and Embase searches (07/2014 to 04/2016)</li> </ul>	<b>&lt; 3200</b>	<b>320</b>	
<ul style="list-style-type: none"> <li>• Panel members' identification*</li> </ul>	ongoing		
Number of relevant references reported in manuscript (submitted June 10, 2016)			<b>210</b>

\*Of note, individual panel members collected relevant evidence throughout the process and reviewed materials submitted by manufacturers (particularly for safety issues) and this process cannot be quantified.

**eTable 2. Search Terms Used and Results of Embase and PubMed Literature Searches\***

**INITIAL SEARCH STRATEGY**

Search	EMBASE QUERY	Results
#8	#6 AND date limit 1 February 2016 to 1 March 2016	77
#7	#6 AND date limit 24 June 2014 to 22 March 2016 (searched 8 March 2016)	2061
#6	#5 AND [humans]/lim AND ([adult]/lim OR [adolescent]/lim OR 'pregnant':ab,ti OR 'pregnancy':ab,ti)	14848
#5	#1 AND #2 AND #3 AND #4	22941
#4	'anti hiv agent'/exp/mj OR 'anti human immunodeficiency virus agent'/exp/mj OR 'antiretrovirus agent'/exp/mj OR 'highly active antiretroviral therapy'/exp/mj OR 'antiretroviral':ti OR 'anti-retroviral':ti OR haart:ti OR 'nucleoside reverse transcriptase inhibitor'/exp/mj OR 'nrti':ab,ti OR 'non-nucleoside reverse transcriptase inhibitor'/exp/mj OR 'nonnucleoside reverse transcriptase inhibitor':ab,ti OR 'nnrti':ab,ti OR 'protease inhibitor'/exp/mj OR 'integrase inhibitor'/exp/mj OR 'fusion inhibitor' OR 'chemokine receptor antagonist'/exp/mj OR 'ccr5':ab,ti OR 'tenofovir'/exp/mj OR 'efavirenz'/exp/mj OR 'dolutegravir'/exp/mj OR 'elvitegravir'/exp/mj OR 'cobicistat'/exp/mj OR 'raltegravir'/exp/mj OR 'emtricitabine'/exp/mj OR 'lamivudine'/exp/mj OR 'rilpivirine'/exp/mj OR 'darunavir'/exp/mj OR 'atazanavir'/exp/mj OR 'abacavir'/exp/mj OR 'lopinavir'/exp/mj OR 'ritonavir'/exp/mj OR 'nevirapine'/exp/mj OR 'fosamprenavir'/exp/mj OR 'tenofovir':ab,ti OR 'tdf':ab,ti OR 'efavirenz':ab,ti OR 'efv':ab,ti OR 'dolutegravir':ab,ti OR 'elvitegravir':ab,ti OR 'cobicistat':ab,ti OR 'raltegravir':ab,ti OR 'emtricitabine':ab,ti OR 'lamivudine':ab,ti OR 'rilpivirine':ab,ti OR 'darunavir':ab,ti OR 'atazanavir':ab,ti OR 'abacavir':ab,ti OR 'lopinavir':ab,ti OR 'ritonavir':ab,ti OR 'nevirapine':ab,ti OR 'fosamprenavir':ab,ti OR 'boosted pi':ab,ti OR 'treatment failure'/exp OR 'treatment failure':ab,ti OR 'second-line' OR 'second-line':ab,ti OR 'salvage therapy'/exp OR 'salvage therapy':ab,ti OR ('antiretroviral':ab,ti AND 'resistance':ab,ti) OR ('antiretroviral':ab,ti AND 'drug resistance'/exp/mj) OR ('antiretroviral':ab,ti AND 'serious adverse':ab,ti)	388201
#3	'randomized controlled trial'/exp OR 'randomized':ab,ti OR 'randomised':ab,ti OR 'randomly':ab,ti OR 'intervention':ab,ti OR 'cohort analysis'/exp OR 'cohort':ab,ti OR 'controlled study'/exp OR 'interventional studies'/exp OR 'systematic review':ti OR 'meta-analysis':ti OR [cochrane review]/lim	6170946
#2	'patients'/exp OR patient*:ab,ti OR participant*:ab,ti OR adult*:ab,ti OR adolescent*:ab,ti	8281584
#1	'hiv'/exp/mj OR 'human immunodeficiency virus infection'/exp/mj OR 'human immunodeficiency virus'/exp/mj OR 'human immunodeficiency virus infected patient'/exp/mj OR hiv*:ti OR 'human immunodeficiency virus':ti OR 'acquired immune deficiency syndrome':ti OR 'acquired immunodeficiency syndrome':ti	308941

Search	PubMed query	Results
#7	#5 and date limit: 1 February 2016 to 31 December 2016 (searched 8 March 2016)	130
#6	#5 and date limit: 24 June 2014 to 31 December 2016 (searched 8 March 2016)	2162
#6	#5 AND NOT (infants[ti] OR child[ti] OR children[ti] OR pediatric[ti] OR paediatric[ti] OR animal[tw] OR simian[tw] OR feline[tw] OR lapine[tw] OR murine[tw] OR monkey[tw] OR rhesus[tw] OR baboon[tw] OR "in vitro"[tw] OR "in vivo"[tiab] OR genetic[ti] OR molecular[ti] OR genotyp*[ti] OR decentral*[ti] OR de-central*[ti] OR task-shifting[ti] OR taskshifting[ti])	16754
#5	#1 AND #2 AND #3 AND #4	19301
#4	antiretroviral agents[mh] OR anti-HIV agents[mh] OR highly active antiretroviral therapy[tiab] OR antiretroviral therapy[mh] OR antiretroviral[tiab] OR anti-retroviral[tiab] OR haart[ti] OR nucleoside reverse transcriptase inhibitors[mh] OR nucleoside reverse transcriptase inhibitor*[tiab] OR nrti[tiab] OR non-nucleoside reverse transcriptase inhibitors[mh] OR non-nucleoside reverse transcriptase inhibitor*[tiab] OR nonnucleoside reverse transcriptase inhibitor*[tiab] OR nnrti[tiab] OR protease inhibitors[mh] OR protease inhibitor*[tiab] OR integrase inhibitors[mh] OR integrase inhibitor*[tiab] OR hiv fusion inhibitors[mh] OR fusion inhibitor*[tiab] OR CCR5 receptor antagonists[mh] OR ccr5[tiab] OR tenofovir[mh] OR TDF[tiab] OR efavirenz[mh] OR EFV[tiab] OR dolutegravir[mh] OR elvitegravir[mh] OR cobicistat[mh] OR raltegravir[mh] OR emtricitabine[mh] OR lamivudine[mh] OR rilpivirine[mh] OR darunavir[mh] OR atazanavir[mh] OR abacavir[mh] OR lopinavir[mh] OR ritonavir[mh] OR nevirapine[mh] OR fosamprenavir[mh] OR tenofovir[tiab] OR efavirenz[tiab] OR dolutegravir[tiab] OR elvitegravir[tiab] OR cobicistat[tiab] OR raltegravir[tiab] OR emtricitabine[tiab] OR lamivudine[tiab] OR rilpivirine[tiab] OR darunavir[tiab] OR atazanavir[tiab] OR abacavir[tiab] OR lopinavir[tiab] OR ritonavir[tiab] OR nevirapine[tiab] OR fosamprenavir[tiab] OR boosted PI[tiab] OR treatment failure[mh] OR treatment failure[tiab] OR second-line[tiab] OR salvage therapy[tiab] OR (antiretroviral[tw] AND resistance[tiab]) OR (antiretroviral[tw] AND drug resistance, viral[mh]) OR (antiretroviral[tw] AND serious adverse[tiab])	249257
#3	randomized controlled trial[pt] OR randomized controlled trials[mh] OR randomized[tiab] OR randomised[tiab] OR randomly[tiab] OR cohort studies[mh] OR cohort*[tiab] OR controlled[tiab] OR clinical trials[mh] OR trial[tiab] OR intervention[tiab] OR systematic review[ti] OR meta-analysis[ti] OR "The Cochrane database of systematic reviews"[Journal]	3136074
#2	Patients[mh] OR patient*[tiab] OR participant*[tiab] OR adult*[tiab] OR adolescent*[tiab] OR pregnant[tiab] OR pregnancy[tiab]	6456230
#1	HIV infections[mh] OR human immunodeficiency virus[mh] OR acquired immune deficiency syndrome[mh] OR HIV[ti] OR HIV*[ti] OR AIDS[ti] OR human immunodeficiency virus[ti] OR acquired immune deficiency syndrome[ti] OR acquired immunodeficiency syndrome[ti]	303078

- Pooling Embase and PubMed results for 6/24/14 through 2016 (including “ahead of print” records): 4223 records
  - Removed 905 duplicates: There are 3318 unique records for that period
- Pooling search results for 2/1/16 through 3/1/16: 207 records
  - Remove 24 duplicates: There are 183 unique records for that period

## FINAL SEARCH STRATEGY

Search	Embase Query	Results
#7	#14 AND #15 AND #17 AND #20 AND #21 AND [2014-2016]/py	706
#6	#14 AND #15 AND #17 AND #20 AND #21	4575
#5	'human immunodeficiency virus'/exp/mj OR 'acquired immunodeficiency syndrome'/exp/mj OR 'hiv'/exp/mj	155710
#4	'dideoxynucleosides'/exp/mj OR 'dideoxynucleosides'/mj OR 'ccr5' OR 'nucleoside reverse transcriptase inhibitor'/exp/mj OR 'nucleoside reverse transcriptase inhibitor'/mj OR 'non-nucleoside reverse transcriptase inhibitor'/exp/mj OR 'non-nucleoside reverse transcriptase inhibitor'/mj OR 'protease inhibitor'/exp/mj OR 'protease inhibitor'/mj OR 'integrase inhibitor'/exp/mj OR 'integrase inhibitor'/mj OR 'chemokine receptor antagonist'/exp/mj OR 'chemokine receptor antagonist'/mj OR 'fusion inhibitor' OR 'abacavir'/exp/mj OR 'abacavir'/mj OR 'amprenavir'/exp/mj OR 'amprenavir'/mj OR 'atazanavir'/exp/mj OR 'atazanavir'/mj OR 'cobicistat'/exp/mj OR 'cobicistat'/mj OR 'darunavir'/exp/mj OR 'darunavir'/mj OR 'delavirdine'/exp/mj OR 'delavirdine'/mj OR 'didanosine'/exp/mj OR 'didanosine'/mj OR 'dolutegravir'/exp/mj OR 'dolutegravir'/mj OR 'efavirenz'/exp/mj OR 'efavirenz'/mj OR 'elvitegravir'/exp/mj OR 'elvitegravir'/mj OR 'emtricitabine'/exp/mj OR 'emtricitabine'/mj OR 'etravirine'/exp/mj OR 'etravirine'/mj OR 'fosamprenavir'/exp/mj OR 'fosamprenavir'/mj OR 'indinavir'/exp/mj OR 'indinavir'/mj OR 'lamivudine'/exp/mj OR 'lamivudine'/mj OR 'lopinavir'/exp/mj OR 'lopinavir'/mj OR 'nelfinavir'/exp/mj OR 'nelfinavir'/mj OR 'nevirapine'/exp/mj OR 'nevirapine'/mj OR 'raltegravir'/exp/mj OR 'raltegravir'/mj OR 'rilpivirine'/exp/mj OR 'rilpivirine'/mj OR 'ritonavir'/exp/mj OR 'ritonavir'/mj OR 'saquinavir'/exp/mj OR 'saquinavir'/mj OR 'stavudine'/exp/mj OR 'stavudine'/mj OR 'tenofovir'/exp/mj OR 'tenofovir'/mj OR 'tipranavir'/exp/mj OR 'tipranavir'/mj OR 'zalcitabine'/exp/mj OR 'zalcitabine'/mj OR 'zidovudine'/exp/mj OR 'zidovudine'/mj OR '3tc'/exp/mj OR '3tc'/mj OR 'abc' OR 'apv' OR 'atv' OR 'atv/c' OR 'atv/r' OR 'cobi' OR 'd4t'/exp/mj OR 'd4t'/mj OR 'ddc'/exp/mj OR 'ddc'/mj OR 'ddi'/exp/mj OR 'ddi'/mj OR 'dlv' OR 'drv' OR 'drv/c' OR 'drv/r' OR 'dtg' OR 'efv' OR 'efv/c/tdf/ftc' OR 'etr' OR 'evg' OR 'evg/c' OR 'evg/c/tdf/ftc' OR 'evg/r' OR 'fpv' OR 'fpv/r' OR 'ftc' OR 'idv' OR 'lpv' OR 'lpv/r' OR 'mvc' OR 'nfv' OR 'nvp' OR 'pi/c' OR 'pi/r' OR 'ral' OR 'rpv' OR 'rtv' OR 'sqv' OR 'sqv/r' OR 'tdf' OR 'tpv' OR 'tpv/r' OR 'zdv'/exp/mj OR 'zdv'/mj OR 'aptivus'/exp/mj OR 'aptivus'/mj OR 'crixivan'/exp/mj OR 'crixivan'/mj OR 'descovy' OR 'edurant'/exp/mj OR 'edurant'/mj OR 'emtriva'/exp/mj OR 'emtriva'/mj OR 'epivir'/exp/mj OR 'epivir'/mj OR 'fuzeon'/exp/mj OR 'fuzeon'/mj OR 'intelence'/exp/mj OR 'intelence'/mj OR 'invirase'/exp/mj OR 'invirase'/mj OR 'isentress'/exp/mj OR 'isentress'/mj OR 'lexiva'/exp/mj OR 'lexiva'/mj OR 'norvir'/exp/mj OR 'norvir'/mj OR 'prezista'/exp/mj OR 'prezista'/mj OR 'rescriptor'/exp/mj OR 'rescriptor'/mj OR 'retrovir'/exp/mj OR 'retrovir'/mj OR 'reyataz'/exp/mj OR 'reyataz'/mj OR 'selzentry'/exp/mj OR 'selzentry'/mj OR 'sustiva'/exp/mj OR 'sustiva'/mj OR 'tivicay'/exp/mj OR 'tivicay'/mj OR 'tybost'/exp/mj OR 'tybost'/mj OR 'videx'/exp/mj OR 'videx'/mj OR 'viracept'/exp/mj OR 'viracept'/mj OR 'viramune'/exp/mj OR 'viramune'/mj OR 'viread'/exp/mj OR 'viread'/mj OR 'vitekta'/exp/mj OR 'vitekta'/mj OR	265413

	'zerit'/exp/mj OR 'zerit'/mj OR 'ziagen'/exp/mj OR 'ziagen'/mj OR 'atrilpla'/exp/mj OR 'atrilpla'/mj OR 'combivir'/exp/mj OR 'combivir'/mj OR 'complera'/exp/mj OR 'complera'/mj OR 'epzicom'/exp/mj OR 'epzicom'/mj OR 'evotaz'/exp/mj OR 'evotaz'/mj OR 'genvoya'/exp/mj OR 'genvoya'/mj OR 'kaletra'/exp/mj OR 'kaletra'/mj OR 'maraviroc'/exp/mj OR 'maraviroc'/mj OR 'odefsey' OR 'prezcobix'/exp/mj OR 'prezcobix'/mj OR 'stribild'/exp/mj OR 'stribild'/mj OR 'trumeq'/exp/mj OR 'trumeq'/mj OR 'trizivir'/exp/mj OR 'trizivir'/mj OR 'truvada'/exp/mj OR 'truvada'/mj OR 'biological response modifier'/exp/mj OR 'biological response modifier'/mj OR 'histone deacetylase inhibitor'/exp/mj OR 'histone deacetylase inhibitor'/mj OR 'amd-070'/exp/mj OR 'amd-070'/mj OR 'amdoxovir'/exp/mj OR 'amdoxovir'/mj OR 'apricitabine'/exp/mj OR 'apricitabine'/mj OR 'bms-955176' OR 'cabotegravir'/exp/mj OR 'cabotegravir'/mj OR 'cenicriviroc'/exp/mj OR 'cenicriviroc'/mj OR 'censavudine'/exp/mj OR 'censavudine'/mj OR 'dexelvucitabine'/exp/mj OR 'dexelvucitabine'/mj OR 'doravirine'/exp/mj OR 'doravirine'/mj OR 'elvucitabine'/exp/mj OR 'elvucitabine'/mj OR 'fosdevirine'/exp/mj OR 'fosdevirine'/mj OR 'fostemsavir'/exp/mj OR 'fostemsavir'/mj OR 'ibalizumab'/exp/mj OR 'ibalizumab'/mj OR 'incb-9471' OR 'kp-1461' OR 'lersivirine'/exp/mj OR 'lersivirine'/mj OR 'lexgenleucel-t'/exp/mj OR 'lexgenleucel-t'/mj OR 'monomeric dapta' OR 'mpc-4326' OR 'panobinostat'/exp/mj OR 'panobinostat'/mj OR 'peginterferon alfa-2a'/exp/mj OR 'peginterferon alfa-2a'/mj OR 'pro-140'/exp/mj OR 'pro-140'/mj OR 'psi-5004'/exp/mj OR 'psi-5004'/mj OR 'rintatolimod'/exp/mj OR 'rintatolimod'/mj OR 'romidepsin'/exp/mj OR 'romidepsin'/mj OR 'sb-728-t' OR 'tmc-310911' OR 'tucaresol'/exp/mj OR 'tucaresol'/mj OR 'valproic acid'/exp/mj OR 'valproic acid'/mj OR 'vicriviroc'/exp/mj OR 'vicriviroc'/mj OR 'vorinostat'/exp/mj OR 'vorinostat'/mj	
#3	'clinical trial'/exp OR 'cohort analysis'/exp OR 'comparative study'/exp OR 'controlled clinical trial'/exp OR 'controlled study'/exp OR 'double blind procedure'/exp OR 'major clinical study'/exp OR 'multicenter study'/exp OR 'prospective study'/exp OR 'randomized controlled trial'/exp OR 'randomized controlled trial (topic)'/exp OR 'randomized':ab,ti OR 'randomised':ab,ti OR 'randomly':ab,ti OR 'cohort':ab,ti OR 'trial':ab,ti OR 'groups':ab,ti OR 'compared':ab,ti OR 'versus':ab,ti OR 'vs':ab,ti OR 'noninferiority' OR 'non-inferiority' OR 'blinded' OR 'open label'	10773294
#2	'patient'/exp OR 'patient' OR 'patient'/de OR patient OR 'patients'/exp OR 'patients' OR 'patients'/de OR patients OR participant OR participants OR 'adult'/exp OR 'adult' OR 'adult'/de OR adult OR adults OR 'pregnant women'/exp OR 'pregnant women'/de OR 'pregnant women' OR 'research subjects'/exp OR 'research subjects'/de OR 'research subjects' OR 'art-naïve' OR 'art-experienced'	11080615
#1	'anti hiv agent'/exp OR 'anti hiv agent' OR 'anti human immunodeficiency virus agent'/exp OR 'anti human immunodeficiency virus agent' OR 'antiretrovirus agent'/exp OR 'antiretrovirus agent' OR 'antiretroviral' OR 'anti-retroviral'	177814

Search	PubMed Query	Results
#7	Search #6 AND Publication date from 2014/06/24 to 2016/12/31	1202
#6	Search #1 AND #2 AND #3 AND #4 AND #5	12451
#5	Search clinical trial OR ((controlled OR clinical) AND trial) OR comparative study OR (control* AND study) OR double blind procedure OR major clinical study OR multicenter study OR prospective study OR randomized controlled trial OR randomized controlled trial[pt] OR randomized[tiab] OR randomised[tiab] OR randomly[tiab] OR cohort studies[mh] OR cohort[tiab] OR trial[tiab] OR groups[tiab] OR compared[tiab] OR versus[tiab] OR vs[tiab] OR noninferiority[tw] OR non-inferiority[tw] OR blinded[tiab] OR open label[tiab]	7170251
#4	Search human immunodeficiency virus OR human immune deficiency virus OR acquired immunodeficiency syndrome OR acquired immune deficiency syndrome OR hiv* OR HIV/AIDS OR HIV-1	354810
#3	Search patients[mh] OR patient[tiab] OR patients [tiab] OR research subjects[mh] OR participant[tiab] OR participants[tiab] OR adults[mh] OR adult[tiab] OR adults[tiab] OR pregnant women[mh] OR pregnant women[tiab] OR (women[tiab] AND pregnant[tiab]) OR ART-naïve[tiab] OR ART-experienced[tiab]	8773717
#2	Search antiretroviral agents/therapeutic use[mh] OR Anti-HIV Agents/therapeutic use OR antiretroviral[tw] OR anti-retroviral[tw] OR HIV Infections/drug therapy[MAJR]	78117
#1	Search "Dideoxynucleosides"[nm] OR nucleoside reverse transcriptase inhibitor[mh] OR nucleoside reverse transcriptase inhibitor OR non-nucleoside reverse transcriptase inhibitor[mh] OR non-nucleoside reverse transcriptase inhibitor OR NRTI OR NNRTI OR protease inhibitor[mh] OR protease inhibitor OR integrase inhibitor[mh] OR INSTI OR integrase inhibitor OR chemokine receptor antagonist[mh] OR "chemokine receptor antagonist" OR ccr5 OR fusion inhibitor OR abacavir OR amprenavir OR atazanavir OR cobicistat OR darunavir OR delavirdine OR didanosine OR dolutegravir OR efavirenz OR elvitegravir OR emtricitabine OR etravirine OR fosamprenavir OR indinavir OR lamivudine OR lopinavir OR nelfinavir OR nevirapine OR raltegravir OR rilpivirine OR ritonavir OR saquinavir OR stavudine OR tenofovir OR tipranavir OR zalcitabine OR zidovudine OR 3tc OR abc OR apv OR atv OR atv/c OR atv/r OR cobv OR d4t OR ddc OR ddi OR dlv OR drv OR drv/c OR drv/r OR dtg OR efv OR efv/c/tdf/ftc OR etr OR evg OR evg/c OR evg/c/tdf/ftc OR evg/r OR fpv OR fpv/r OR ftc OR idv OR lpv OR lpv/r OR mvc OR nfz OR nvp OR pi/c OR pi/r OR ral OR rpv OR rtv OR sqv OR sqv/r OR tdf OR tpv OR tpv/r OR zdv OR zdv OR aptivus OR aptivus OR crixivan OR crixivan OR descovy OR edurant OR edurant OR emtriva OR emtriva OR epivir OR epivir OR fuzeon OR fuzeon OR intelence OR intelence OR invirase OR invirase	330674

	<p>OR isentress OR isentress OR lexiva OR lexiva OR norvir OR norvir OR  prezista OR prezista OR rescaptor OR rescaptor OR retrovir OR retrovir  OR reyataz OR reyataz OR selzentry OR sustiva OR tivicay OR tybost  OR videx OR viracept OR viramune OR viread OR vitekta OR zerit OR  ziagen OR atripla OR combivir OR complera OR epzicom OR epzicom  OR evotaz OR genvoya OR kaletra OR maraviroc OR odefsey OR  prezcobix OR stribild OR triumeq OR trizivir OR trovada OR “biological  response modifier” OR “histone deacetylase inhibitor” OR amd-070 OR  amd-070 OR amdoxovir OR amdoxovir OR apricitabine OR apricitabine  OR bms-955176 OR cabotegravir OR cabotegravir OR cenicriviroc OR  censavudine OR dexelvucitabine OR doravirine OR elvucitabine OR  fosdevirine OR fostemsavir OR ibalizumab OR incb-9471 OR kp-1461 OR  lersivirine OR lexgenleucel-t OR monomeric dapta OR mpc-4326 OR  panobinostat OR peginterferon alfa-2a OR pro-140 OR psi-5004 OR  rintatolimod OR romidepsin OR sb-728-t OR tmc-310911 OR tucaresol  OR valproic acid OR vicriviroc OR vorinostat</p>	
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\*1910 total results (n=1701 results after removing 209 duplicates).

\*Merged with results from April 5, 2016, and removed 282 already-seen records: **1419** remain; from these removed 141 studies from low- and middle-income countries and 60 studies of pediatric patient populations (n=1218 to screen).

**eTable 3. Information Requested From Antiretroviral Drug Manufacturers**

Manufacturer	Information Requested	Date Requested	Date Received
AbbVie	<ul style="list-style-type: none"> <li>• Presented at national or international conferences or has been published in the peer-reviewed literature</li> <li>• Data should be from prospective clinical trials (ie, properly randomized controlled trials), cohort studies, and ancillary trials (pharmacologic and drug interaction studies)</li> <li>• Any information about newly recognized toxicities and complications associated with your product(s) would be helpful.</li> </ul>	03/14/2016	03/28/2016
Bristol-Myers Squibb	<ul style="list-style-type: none"> <li>• Presented at national or international conferences or has been published in the peer-reviewed literature</li> <li>• Data should be from prospective clinical trials (ie, properly randomized controlled trials), cohort studies, and ancillary trials (pharmacologic and drug interaction studies)</li> <li>• Any information about newly recognized toxicities and complications associated with your product(s) would be helpful.</li> </ul>	03/14/2016	03/31/2016
Gilead Sciences, Inc	<ul style="list-style-type: none"> <li>• Presented at national or international conferences or has been published in the peer-reviewed literature</li> <li>• Data should be from prospective clinical trials (ie, properly randomized controlled trials), cohort studies, and ancillary trials (pharmacologic and drug interaction studies)</li> <li>• Any information about newly recognized toxicities and complications associated with your product(s) would be helpful.</li> </ul>	03/14/2016	04/01/2016 and 05/04/2016
Janssen Therapeutics	<ul style="list-style-type: none"> <li>• Presented at national or international conferences or has been published in the peer-reviewed literature</li> <li>• Data should be from prospective clinical trials (ie, properly randomized controlled trials), cohort studies, and ancillary trials (pharmacologic and drug interaction studies)</li> <li>• Any information about newly recognized toxicities and complications associated with your product(s) would be helpful.</li> </ul>	03/14/2016	04/01/2016
Merck & Co, Inc	<ul style="list-style-type: none"> <li>• Presented at national or international conferences or has been published in the peer-reviewed literature</li> <li>• Data should be from prospective clinical trials (ie, properly randomized controlled trials), cohort studies, and ancillary trials (pharmacologic and drug interaction studies)</li> <li>• Any information about newly recognized toxicities and complications associated with your product(s) would be helpful.</li> </ul>	03/14/2016	04/01/2016

Genentech	<ul style="list-style-type: none"> <li>• Presented at national or international conferences or has been published in the peer-reviewed literature</li> <li>• Data should be from prospective clinical trials (ie, properly randomized controlled trials), cohort studies, and ancillary trials (pharmacologic and drug interaction studies)</li> <li>• Any information about newly recognized toxicities and complications associated with your product(s) would be helpful.</li> </ul>	03/14/2016	03/18/2016
ViiV Healthcare	<ul style="list-style-type: none"> <li>• Presented at national or international conferences or has been published in the peer-reviewed literature</li> <li>• Data should be from prospective clinical trials (ie, properly randomized controlled trials), cohort studies, and ancillary trials (pharmacologic and drug interaction studies)</li> <li>• Any information about newly recognized toxicities and complications associated with your product(s) would be helpful.</li> </ul>	03/14/2016	03/31/2016