HIV
Background, new developments, key strategies

INTRODUCTION

Human Immunodeficiency Virus (HIV) is the virus that can lead to Acquired Immunodeficiency Syndrome, or AIDS. No safe and effective cure for HIV currently exists, but with proper medical care, it can be controlled.¹

- **1.2 million** people in the United States were living with HIV at the end of 2011 (most recent data).²
- **14% do not know** they are infected.²
- New infections have **remained at about 50,000 per year** for over a decade.³
- **13,712 people** diagnosed with AIDS died in 2012 in the US.²

HIV WORKS BY DESTROYING THE BODY’S DEFENSES

A human CD4 T-cell infected by numerous HIV particles

The HIV virus inserts itself into healthy immune system cells and then uses the cell to manufacturer new HIV virus that can infect other immune cells. This process ends up by destroying most of the body’s functioning immune cells. Eventually, the body can’t fight off infections and the HIV infection leads to AIDS plus other, opportunistic infections.¹

Estimated lifetime cost of care for one HIV/AIDS patient

Up to **$402,000**


Human blood with red blood cells, T-cells (orange) and platelets (green)*

* Colors enhanced for clarity.
TREATMENT

Today, treatment for HIV involves antiretroviral therapy or ART. HIV mutates quickly; attacking with 1 drug allows it to evade destruction and build resistance. Therefore, best-practice calls for ART drugs taken in combination to suppress the growth of the virus.4

<table>
<thead>
<tr>
<th>ART therapy with 1 drug</th>
<th>Cell infected with HIV (blue)</th>
<th>Mutated fragments survive 1-drug treatment</th>
<th>Reinfected with mutated HIV</th>
</tr>
</thead>
</table>

| ART therapy with 3 or more drugs | Cell infected with HIV (blue) | 3-combined ART drugs destroy new fragments | Virus suppressed to undetectable levels |


EFFECTIVE TREATMENTS MEAN FEWER DEATHS AND GREATER PREVALENCE OF THE DISEASE

-72% Decrease in deaths per year after 1995

+60% Increase in persons living with HIV after 1995

ACCESS AND ENGAGEMENT IN CARE

HIV Care Continuum

Testing and care engagement lacking

PERCENT OF ALL PEOPLE LIVING WITH HIV

82% Diagnosed

40% Engaged in care

33% Prescribed ART

25% Virally suppressed

UNDERSTANDING TREATMENT COSTS

The average monthly cost for the top 5 HIV drugs is $1,400 per month, compared to $3,000 per month for all specialty drugs. So, while not the most expensive specialty drugs, medications used to treat HIV/AIDS can still be costly, since HIV treatments are required for life.

Cost of Direct Medical Care for HIV/AIDS

People switch from one “line” or combination of drugs to another because they develop a resistance, or they are unable to tolerate a particular drug or combination of drugs.

<table>
<thead>
<tr>
<th>Therapy Line 1</th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>46% Medical</td>
<td>45.9% Rx</td>
<td>= $33,674</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
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<tr>
<th>Therapy Line 1</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>54% Medical</td>
<td>38.8% Rx</td>
<td>= $39,191</td>
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<td>3</td>
<td>4</td>
<td>5</td>
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</thead>
<tbody>
<tr>
<td></td>
<td>58% Medical</td>
<td>35.5% Rx</td>
<td>= $39,882</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
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</table>


HIV Ranks 3rd in Specialty Spending

- $33b Oncology
- $22b Autoimmune
- $15b HIV Antivirals

Source: IMS Health, National Sales Perspectives, Dec. 2014

ART Price Growth: Steady & Strong

+52% increase

IMS Health, Medicines Use and Spending Shifts. April, 2015.
TREATMENT COSTS, BUT ALSO PAYS
Despite their high cost, studies have shown early use of combination treatments to be cost-effective.7

Actual vs Projected death rates for HIV/AIDS in the United States

862,000 PREMATURE DEATHS AVOIDED

ART therapies are helping people live longer, more productive lives:

HIV Medicines Increase Life Expectancy

A person without HIV
79 years

A person with HIV diagnosed at age 20 taking current HIV medicines
71 years

A person with HIV diagnosed at age 20 not taking current HIV medicines
32 years

STILL NEEDED: A CURE OR VACCINE
Some experts worry about the growing cost of ART given the length of treatment. The total year-over-year cost of therapy will continue to rise – perhaps to unsustainable levels.8
THE END OF HIV?

No major viral epidemic has ever been brought under control without a vaccine.⁹

Many argue that finding an HIV vaccine represents the world's best long-term hope for breaking the chain of HIV infection and ending AIDS.¹⁰

HIV is an extremely difficult target for a vaccine. The virus comes in many varieties and can escape the immune system by mutating rapidly. While vaccination studies began in 1987, to date, none has proven effective against HIV. Still, creating safe and effective vaccines is rarely a quick or simple process:

Time to develop a vaccine

Duration between discovery of microbiologic cause of selected infectious diseases and development of a vaccine

<table>
<thead>
<tr>
<th>Disease</th>
<th>Year Discovered</th>
<th>Year Developed</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typhoid</td>
<td>1884</td>
<td>1989</td>
<td>105 years</td>
</tr>
<tr>
<td>Polio</td>
<td>1908</td>
<td>1955</td>
<td>47 years</td>
</tr>
<tr>
<td>HPV</td>
<td>1984</td>
<td>2006</td>
<td>22 years</td>
</tr>
<tr>
<td>Measles</td>
<td>1953</td>
<td>1963</td>
<td>10 years</td>
</tr>
<tr>
<td>HIV</td>
<td>1983</td>
<td></td>
<td></td>
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</tbody>
</table>

AVAC AIDS Vaccine Handbook

A breakthrough?

In 2009 a human trial in Thailand called RV144 demonstrated for the first time that a vaccine could reduce infection rates.¹¹ Today there are many vaccines under development, including some that build directly on the RV144 results. Some are in human trials now; others will be soon.

Decades of Failure – then sudden progress

![0 1987-2008: Number of vaccines tested that showed ANY protection from HIV 31% RV 144 study results (2009): Percent protection from HIV](image)


The number of aids vaccine trials underway (2015)

Vaccine strategies in clinical trial (2015)*

<table>
<thead>
<tr>
<th>Phase II</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase I</td>
<td>29</td>
</tr>
</tbody>
</table>

*Select vaccine strategies in ongoing clinical trials. Some strategies studied in more than one ongoing trial. AVAC Prevention Research & Development Database, 2015

While prevention and treatment with ART drugs have helped, we are still far from stopping the spread of HIV. Ultimately, the only guarantee of an end to the AIDS pandemic is the combination of prevention methods and a safe and effective HIV vaccine.¹²
SPECIALTY MANAGEMENT PROGRAM
Integrated management allows for consistent management and holistic care coordination.

### A Holistic Care Management Approach

<table>
<thead>
<tr>
<th>Personal Care Team</th>
<th>Physician Coordination</th>
<th>Adherence Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personally dedicated clinician coordinates with nurses, doctors other services</td>
<td>Physician outreach, interaction and involvement</td>
<td>Helping to ensure members have what they need to take their drugs on time, as directed</td>
</tr>
<tr>
<td>• Dedicated to specific conditions</td>
<td>• Side effect management</td>
<td>• Pharmacist counseling</td>
</tr>
<tr>
<td>• Behavior health support</td>
<td>• Missed refill notifications</td>
<td>• Refill reminders</td>
</tr>
<tr>
<td>• Empathy training</td>
<td>• Care plan summaries</td>
<td>• Educational materials</td>
</tr>
</tbody>
</table>

### Managing the Total Cost of Complex Conditions

<table>
<thead>
<tr>
<th>Appropriate Use</th>
<th>Benefit Management</th>
<th>Drug Cost and Choice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limiting waste of expensive specialty drugs</td>
<td>Making an impact with Specialty Pharmacy Management Programs:</td>
<td>Driving lower cost options:</td>
</tr>
<tr>
<td>• Quantity management</td>
<td>• Adherence</td>
<td>• Tier 2 options – all conditions</td>
</tr>
<tr>
<td>• Prior authorization</td>
<td>• Increased medical savings</td>
<td>• Step therapy</td>
</tr>
<tr>
<td>• Genetic testing</td>
<td></td>
<td>• Price protection</td>
</tr>
</tbody>
</table>
**MEET BRENDA**

Brenda was diagnosed with HIV 5 years ago. She is working hard to stay compliant with her ART medication regimen. Brenda transitioned into our Specialty Pharmacy Program shortly after her employer switched to OptumRx. She has the advantage of our advanced customer service model that continuously monitors her condition.

What does it mean to manage the total cost of Brenda's condition? Synchronize member touch points and data into **ONE system**.

<table>
<thead>
<tr>
<th>Opportunities</th>
<th>Traditional PBM</th>
<th>OPTIMIZED*</th>
<th>OptumRx Connected Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Adherence Programs</td>
<td>NOT OPTIMIZED</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>2. Clinical Management Program</td>
<td>NOT OPTIMIZED</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>3. Healthy lifestyle programs to encourage condition-appropriate exercises and diet</td>
<td>MISSED</td>
<td>✓</td>
<td>A traditional PBM looking only at pharmacy claims or pharmacy solutions can miss opportunities. Our ONE team approach manages <strong>multiple consumer touch points</strong> to promote real behavior change, like lower cost alternatives, medication adherence or engagement in clinical management programs.</td>
</tr>
<tr>
<td>4. Manage co-morbid depression with synchronized behavioral referrals</td>
<td>MISSED</td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>

* The synchronized care management model described here depends on a minimum specific set of OptumHealth care management services, plus OptumRx pharmacy services. Please speak to your OptumRx or UnitedHealthcare representative for more information about how synchronization can work for you.

**Connected Engagement:**

Every interaction is an opportunity to reduce health risk and lower costs

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Every interaction is an opportunity to reduce health risk and lower costs
MANAGING COSTS WITH CONNECTED CARE

Traditional PBM’s do an adequate job of negotiating discounts, paying claims, managing formularies and so on. But OptumRx is more than an traditional PBM: We are a complete pharmacy care services company.

We focus on managing total condition spending by connecting pharmacy’s impact across all benefits.

*Estimated additional savings over traditional core PBM services based on total pharmacy spend. Illustrative only; results may vary.
References


For more information about how you can manage the cost of HIV, please contact your OptumRx representative.