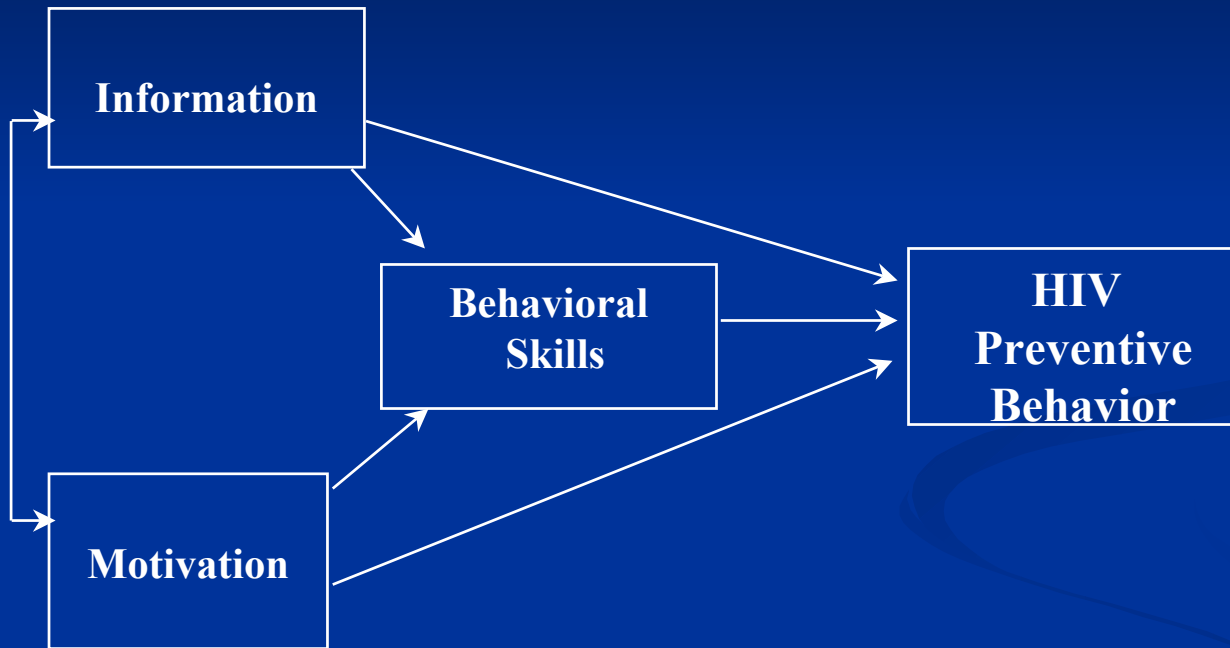


# The Information-Motivation-Behavioral Skills Model (Fisher & Fisher)



# Overview of Adherence Issues

- The Importance of Adherence
- Presenting the IMB Model of Adherence
- Support for the IMB Model of Adherence
- Suggestions for Remediating Information, Motivation, Behavioral Skills, and Adherence Behavior Deficits
- Using the IMB Model in Practice to Solve Adherence Problems

“The power of new treatments is such that a diagnosis of HIV infection is not just different in degree today. It is different in kind. It no longer signifies death. It merely signifies illness

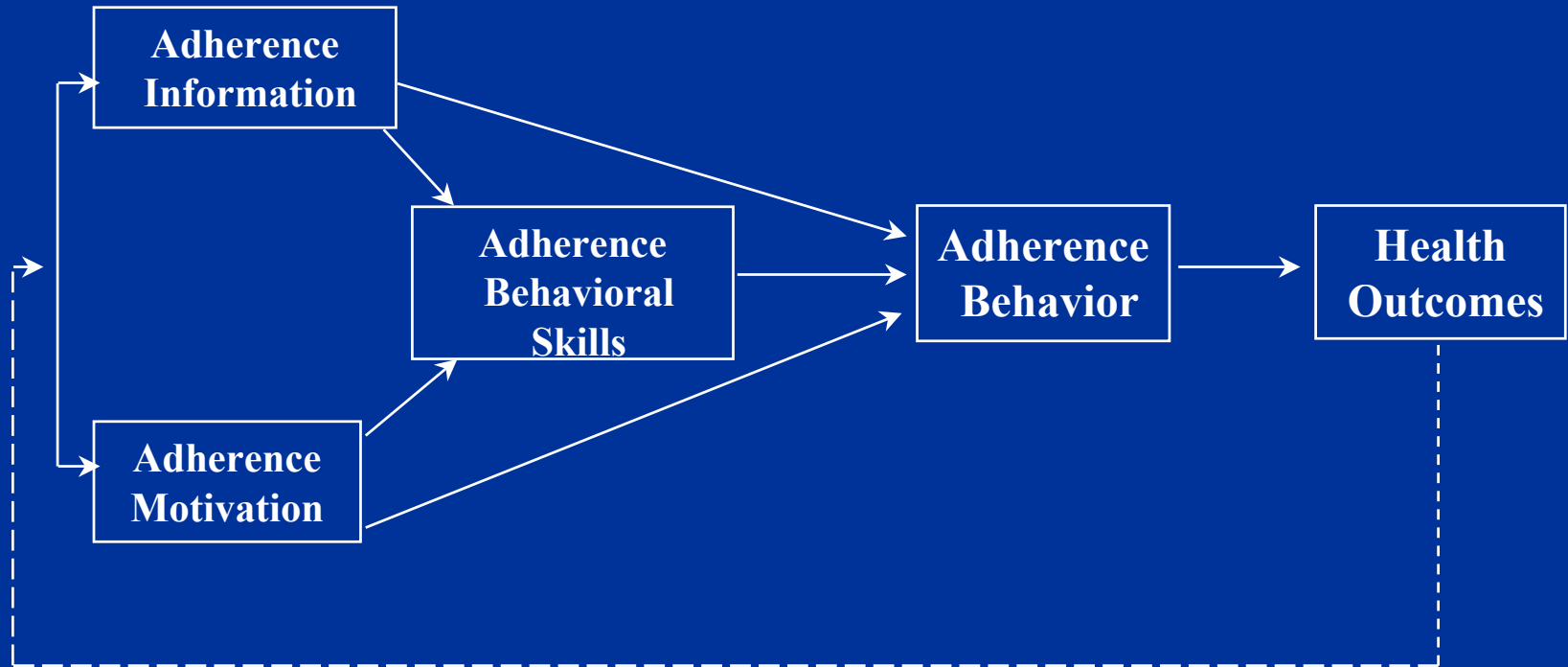
(Sullivan, 1997, p. 54)”

# Definitions of Adherence and Nonadherence

- Classic definition of *adherence*: the extent to which a person's behavior corresponds with medical advice.
- Definition of *nonadherence*: nonadherence occurs when the actual treatment the patient receives is different from the intended treatment.
  - Assessing adherence and nonadherence involves a comparison of the number of doses taken properly with the number of doses prescribed (e.g., Chesney & Ickovics, 1999)

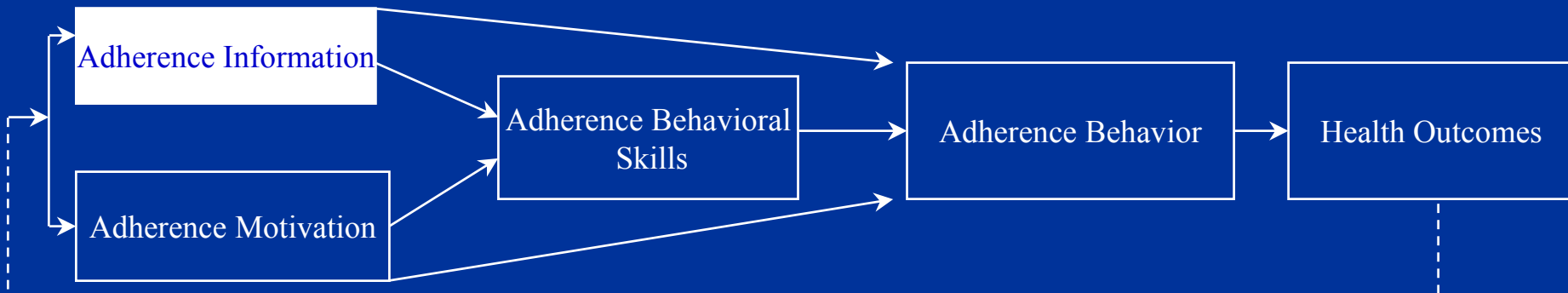
**The Information-  
Motivation-Behavioral  
Skills Model  
of Adherence**

# The Information-Motivation-Behavioral Skills Model of Adherence



# Adherence Information

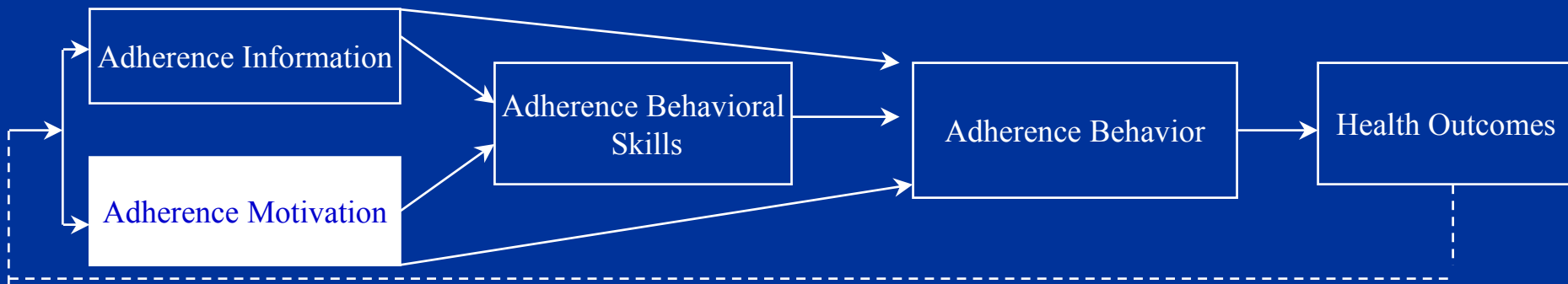
- Information about the regimen... *how* (specific food & fluid requirements) and *when* (timing) to take pills; procedures for missed doses
- Information about adequate adherence... perceived effects of missed dosages, drug holidays, etc.; costs of non-adherence and benefits of adherence
- Information about potential drug interactions & side effects ... for prescription & nonprescription drugs



# Adherence Motivation

## *Psychosocial factors*

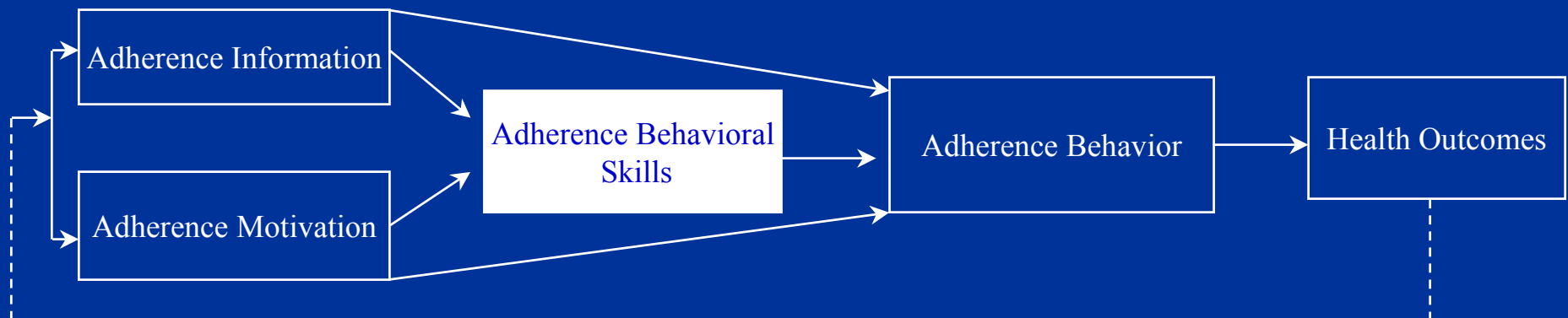
- Attitudes... to medications; to nonadherence (e.g., taking drug holidays); to the perceived benefits of taking medications; to the perceived costs of taking medications; to the perceived obstacles of taking medications; to the individual's drug regimen in particular; re: personal significance of adherence with regimen; trust in provider
- Social Support... social network support for taking medication; social network support for adhering to regimen; support from provider(s) for good adherence; quality of patient-provider interaction
- Behavioral Intentions to adhere
- Perceived Vulnerability... to negative outcomes from nonadherence; to side effects from adherence; to positive outcomes from adherence



# Adherence Behavioral Skills

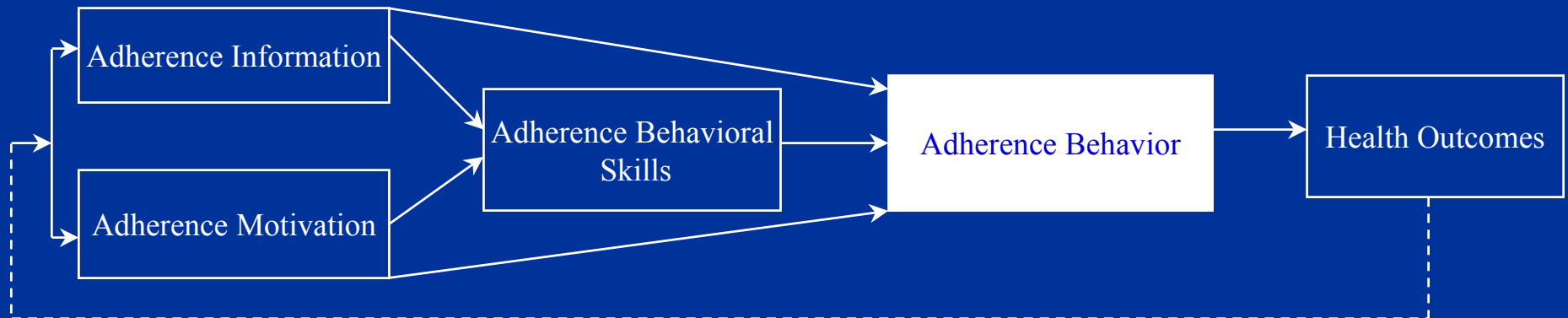
(objective skills + self-efficacy)

- Ability to self-administer medications: obtaining, refilling, taking (including food/fluid intake) & appropriately storing medications
- Ability to incorporate adherence into the ecology of daily life (e.g., creating cues for pill taking times, maintaining confidentiality at work, problem-solving difficult adherence-related situations)
- Ability to identify/cope with side effects
- Ability to obtain further information as needed for proper adherence



# Adherence Behavior

- Proper dosing
- Fulfilling drug administration requirements
- Proper drug storage

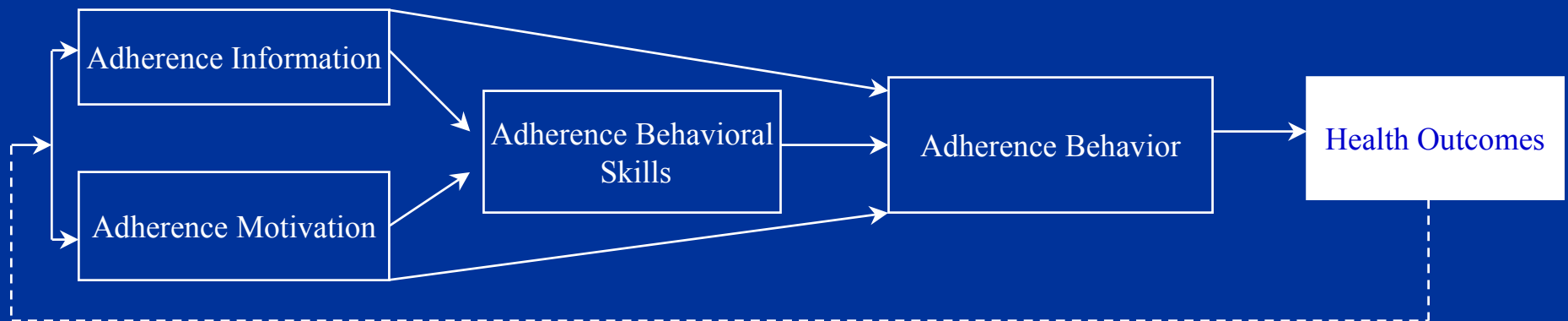


# Health Outcomes

## *Medical*

- CD4 and viral load
- Viral resistance data
- Other health indicators

## *Quality of Life*



# Moderating Factors Affecting Adherence

- Living situation (e.g., homelessness)
- Access to medication/services (e.g., transportation, insurance)
- Other supportive resources necessary to take pills (e.g., support network, home health assistance)
- Other moderating factors

### Adherence Information

- **Information about the regimen**... *how* (specific food & fluid requirements) and *when* (timing) to take pills; procedures for missed doses
- **Information about adequate adherence**... perceived effects of missed dosages, drug holidays, etc.; costs of non-adherence and benefits of adherence
- **Information about potential drug interactions & side effects** ... for prescription & nonprescription drugs

### Adherence Motivation

#### *Psychosocial factors*

- **Attitudes**... to medications; to nonadherence (e.g., taking drug holidays); to the perceived benefits of taking medications; to the perceived costs of taking medications; to the perceived obstacles of taking medications; to the individual's drug regimen in particular; re: personal significance of adherence with regimen; trust in provider
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- **Behavioral intentions to adhere**
- **Perceived Vulnerability**... to negative outcomes from nonadherence; to side effects from adherence; to positive outcomes from adherence.

### Moderating Factors Affecting Adherence

- Living situation (e.g., homeless)
- Access to medication/services (e.g., transportation, insurance)
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### Adherence Behavioral Skills

*(objective skills + self-efficacy)*

- **Ability to self-administer medications:** obtaining, refilling, taking (incl. food/fluid intake) & appropriately storing medications
- **Ability to incorporate adherence into the ecology of daily life** (e.g., creating cues for pill taking times, maintaining confidentiality at work, problem-solving difficult adherence-related situations)
- **Ability to identify/cope with side effects**
- **Ability to obtain further information as needed for proper adherence**

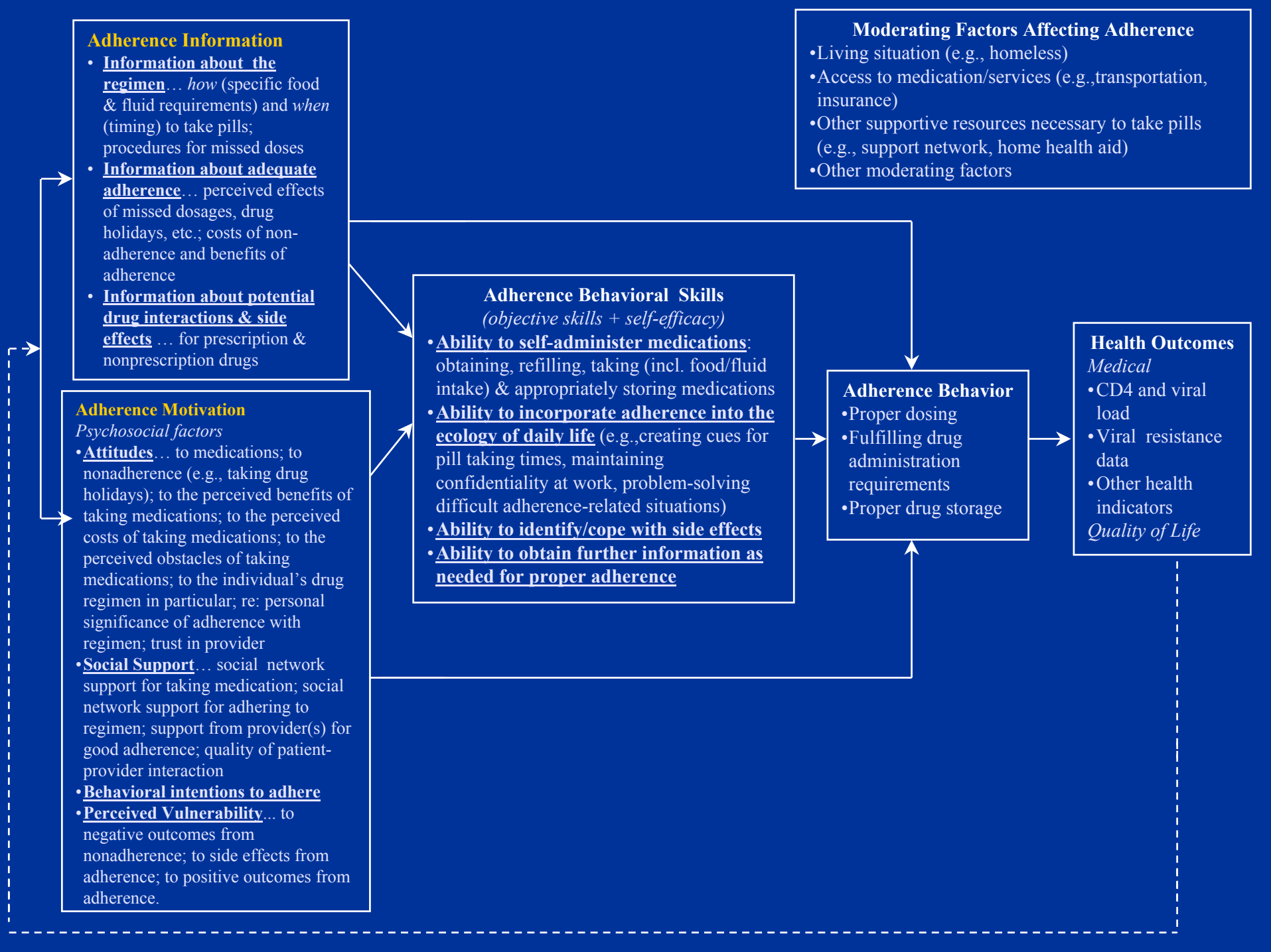
### Adherence Behavior

- Proper dosing
- Fulfilling drug administration requirements
- Proper drug storage

### Health Outcomes

*Medical*

- CD4 and viral load
  - Viral resistance data
  - Other health indicators
- Quality of Life*



**Documented Relationships (To  
Date) Between Factors in the  
Information-Motivation-  
Behavioral Skills Model and  
HAART Adherence**

# Information-Motivation- Behavioral Skills Model of Adherence

## ADHERENCE INFORMATION

- ❑ **ABOUT ONE'S REGIMEN:**
  - DRUGS AND TIMING OF DOSES
  - DIETARY REQUIREMENTS
  - HANDLING MISSED DOSES
  
- ❑ **ABOUT ADEQUATE ADHERENCE:**
  - EFFECTS OF DRUG HOLIDAYS
  - COSTS OF NON-ADHERENCE
  - BENEFITS OF ADHERENCE
  
- ❑ **ABOUT DRUG INTERACTIONS AND SIDE EFFECTS**

## ADHERENCE MOTIVATION

- ❑ **ATTITUDES:**
  - TOWARD MEDICATIONS
  - TOWARD NON-ADHERENCE
  - BENEFITS AND COSTS OF ADHERENCE
  - OBSTACLES TO ADHERENCE
  - TOWARDS INDIVIDUALIZED REGIMEN
  - TRUST IN CLINICIAN
  
- ❑ **SOCIAL SUPPORT FOR TAKING MEDICATIONS:**
  - FROM CLINICIAN
  - FROM SOCIAL NETWORK
  
- ❑ **BEHAVIORAL INTENTION TO ADHERE**
  
- ❑ **PERCEIVED VULNERABILITY:**
  - TO CONSEQUENCES OF NON-ADHERENCE
  - TO POSITIVE OUTCOMES OF ADHERENCE
  - TO SIDE EFFECTS

## ADHERENCE BEHAVIORAL SKILLS

- ❑ **ABILITY TO SELF-ADMINISTER MEDICATIONS:**
  - OBTAINING MEDICATIONS
  - TAKING MEDICATIONS AS PRESCRIBED
  - STORING MEDICATIONS
  
- ❑ **ECOLOGICAL SKILLS:**
  - CUES FOR PILL-TAKING
  - STRATEGIES FOR ADHERENCE IN SPECIFIC SETTINGS (e.g., at work)
  
- ❑ **ABILITY TO IDENTIFY AND COPE WITH SIDE EFFECTS OF MEDICATIONS**
  
- ❑ **ABILITY TO SEEK OUT ADHERENCE INFORMATION AND SUPPORT**

## ADHERENCE BEHAVIOR

- ❑ **PROPER DOSING**
  
- ❑ **FOLLOWING DIETARY REQUIREMENTS**

## HEALTH OUTCOMES

- ❑ **REDUCED VIRAL LOAD**
  
- ❑ **INCREASED CD4 COUNTS**
  
- ❑ **DECREASED VIRAL MUTATIONS**
  
- ❑ **OTHER PSYCHOLOGICAL VARIABLES** (e.g., overall well being)

# Adherence Information

## □ INFORMATION ABOUT ONE'S REGIMEN:

- ***POOR INFORMATION ABOUT TIMING OF DOSES IS ASSOCIATED WITH POOR ADHERENCE***

Arnsten et al. (2000), Bertholon et al. (1999), Catz et al. (2000), Chesney (1997)  
Cohen (2000), Gallant & Block (1998), Ickovics & Meisler (1997)

- ***POOR INFORMATION ABOUT DIETARY REQUIREMENTS IS ASSOCIATED WITH POOR ADHERENCE***

Andrade et al. (2000), Catz et al. (2000), Gerbert et al. (1999)

- ***INDIRECT SUPPORT FOR A RELATION BETWEEN LACK OF INFORMATION ABOUT WHAT TO DO ABOUT MISSED DOSES, AND EFFECTS OF MISSED DOSES, AND POOR ADHERENCE***

Albert et al. (1999); Altice & Friedland (1998); Williams (1989)

# Adherence Information (Cont.)

## □ INFORMATION ABOUT ADEQUATE ADHERENCE:

- *RELATION BETWEEN INFORMATION ABOUT THE CONSEQUENCES OF SELF-IMPOSED, OR PRESCRIBED, DRUG HOLIDAYS AND HAART ADHERENCE REMAINS UNEXPLORED*
- *RELATION BETWEEN INFORMATION ABOUT THE COSTS OF HAART NON-ADHERENCE AND PATIENT'S ADHERENCE REMAINS UNEXPLORED*
- *SUGGESTIVE SUPPORT FOR A RELATION BETWEEN INFORMATION ABOUT THE BENEFITS OF HAART ADHERENCE AND IMPROVED ADHERENCE*

Singh et al. 1999

## □ INFORMATION ABOUT POTENTIAL DRUG INTERACTIONS AND SIDE EFFECTS:

- *INFORMATION ABOUT POTENTIAL DRUG INTERACTIONS AND SIDE EFFECTS IS ASSOCIATED WITH INCREASED ADHERENCE*

Chesney (1997)

Ickovics & Meisler (1997)

# Adherence Motivation

## ▣ ATTITUDES:

- ***POSITIVE ATTITUDES TOWARD HAART MEDICATIONS ARE ASSOCIATED WITH BETTER ADHERENCE***

Richter et al. (1998)    Gordillo et al. (1999)    Moyle (1999)

- ***RELATION BETWEEN ATTITUDES TOWARD NON-ADHERENCE AND HAART ADHERENCE IS STILL UNEXPLORED***

- ***INDIRECT SUPPORT FOR A RELATION BETWEEN PERCEIVED BENEFITS OF ADHERENCE AND GOOD ADHERENCE, AND FOR A RELATION BETWEEN PERCEIVED COSTS OF ADHERENCE AND POOR ADHERENCE***

Betholon et al. (1999)    Chesney (1997)    Gallant & Block (1998)

- ***HAVING A GREATER NUMBER OF PERCEIVED OBSTACLES TO ADHERENCE, AS WELL AS SPECIFIC TYPES OF BARRIERS TO ADHERENCE, ARE ASSOCIATED WITH POORER ADHERENCE***

Proctor et al. (1999); Chesney & Ickovics (1997); Cohen (2000); Ickovics & Meisler (1997);  
Catz et al. (2000)

# Adherence Motivation (Cont.)

## □ ATTITUDES (Continued):

- *SOME SUGGESTION OF A POSITIVE RELATION BETWEEN ATTITUDES ABOUT ONE'S INDIVIDUALIZED HAART REGIMEN AND GOOD ADHERENCE*

Gordillo et al. (1999)

Proctor et al. (1999)

- *GROWING EVIDENCE FOR AN ASSOCIATION BETWEEN POSITIVE CLIENT-CLINICIAN RELATIONSHIP FACTORS AND STRONG ADHERENCE*

Gerbert et al. (1999); Montessori et al. (2000); Proctor et al. (1999)

## □ SOCIAL SUPPORT:

- *INDIRECT CORROBORATION FOR A POSITIVE RELATIONSHIP BETWEEN GENERAL SOCIAL SUPPORT FOR TAKING HAART MEDICATIONS, AND ADHERENCE*

Sorensen et al. (1998)

- *SOCIAL SUPPORT FROM CLINICIANS: GROWING EVIDENCE FOR AN ASSOCIATION BETWEEN POSITIVE CLIENT-CLINICIAN RELATIONSHIP FACTORS AND STRONG ADHERENCE*

Gerbert et al. (1999); Montessori et al. (2000); Proctor et al. (1999)

# Adherence Motivation (Cont.)

## ❑ SOCIAL SUPPORT (Continued):

- ***SOCIAL SUPPORT FROM SOCIAL NETWORK: CONSISTENT EVIDENCE FOR A RELATIONSHIP BETWEEN SOCIAL SUPPORT FROM ONE'S SOCIAL NETWORK AND GOOD ADHERENCE***

Catz et al. (2000); Gallant & Block (1998); Gordillo et al. (1999); Holzemer et al. (1999); Ickovics & Meisler (1997); Proctor et al. (1999); Singh et al. (1999)

## ❑ BEHAVIORAL INTENTIONS:

- ***RELATION BETWEEN BEHAVIORAL INTENTIONS TO ADHERE AND ACTUAL ADHERENCE IS NOT YET KNOWN, BUT BASED ON EXTENSIVE BI~B RESEARCH, IT IS LIKELY TO BE POSITIVE***

## ❑ PERCEIVED VULNERABILITY:

- ***INDIRECT SUPPORT FOR AN ASSOCIATION BETWEEN PERCEIVED VULNERABILITY TO NEGATIVE CONSEQUENCES FROM NON-ADHERENCE, AND BETTER ADHERENCE***

Gerbert et al. (1999)

# Adherence Motivation (Cont.)

## □ PERCEIVED VULNERABILITY (Continued):

- *INDIRECT SUPPORT FOR ASSOCIATION BETWEEN PERCEIVED VULNERABILITY TO POSITIVE OUTCOMES OF ADHERENCE, AND STRONG ADHERENCE*

Richter et al. (1998)

- *RELATIONSHIP BETWEEN PERCEIVED VULNERABILITY TO SIDE EFFECTS FROM ADHERENCE AND ADHERENCE IS NOT YET EXPLORED*

# Adherence Behavioral Skills

## □ ABILITY TO SELF-ADMINISTER MEDICATIONS:

- *RELATION BETWEEN ABILITY TO OBTAIN, TAKE, AND STORE MEDICATIONS AND BETTER ADHERENCE HAS BEEN DEMONSTRATED*

Albert et al. (1999)

## □ ECOLOGICAL SKILLS:

- *THAT BETTER INCORPORATION OF REGIMEN INTO DAILY ROUTINES IS ASSOCIATED WITH BETTER ADHERENCE IS SUGGESTED BY THE FREQUENT ASSOCIATION BETWEEN “FORGETTING” AND POOR ADHERENCE*

Andrade et al. (2000)

Gallant & Block (1998)

Proctor et al. (1999)

Stenzel et al.,(1999)

# Adherence Behavioral Skills (Cont.)

## □ ABILITY TO IDENTIFY AND COPE WITH SIDE EFFECTS OF MEDICATIONS:

- *THERE IS SUGGESTIVE SUPPORT FOR A RELATION BETWEEN ABILITY TO COPE WITH SIDE EFFECTS AND ADHERENCE FROM THE CONSISTENT RELATION BETWEEN SEVERITY OF SIDE EFFECTS AND POORER ADHERENCE*

Holzemer et al. (1999) Proctor et al. (1999) Richter et al. (1998)

## □ ABILITY TO SEEK OUT ADHERENCE INFORMATION AND SUPPORT:

- *SOME INDIRECT EVIDENCE FOR A RELATION BETWEEN ABILITY TO SEEK OUT INFORMATION AND SUPPORT AND ADHERENCE DERIVES FROM RESEARCH SHOWING THAT INFORMATIONAL AND TANGIBLE SUPPORT POSITIVELY AFFECT ADHERENCE*

Singh et al. (1999)

# Relationship between HAAR 1

## Adherence and Health

### Outcomes

#### □ REDUCED VIRAL LOAD:

- *REDUCTION IN VIRAL LOAD IS STRONGER WITH 95% OR GREATER ADHERENCE. IN ADDITION, VIRAL LOAD SUPPRESSION DECREASES WITH MINOR VIOLATIONS IN ADHERENCE.*

Blaschke (1997) Condra et al. (1995) Gordillo et al. (1999)

Holzemer et al. (1999) Singh et al. (1999)

#### □ INCREASED CD4 COUNTS:

- *INCREASES IN CD4 COUNTS ARE RELATED TO GOOD (95% OR MORE) ADHERENCE; DECREASES IN CD4 COUNTS ARE RELATED TO VIOLATIONS IN ADHERENCE*

Singh et al. (1999); Greenberg et al. (1999); Sorensen et al. (1998)

# Relationship between HAART Adherence and Health Outcomes (Cont.)

## □ DECREASED VIRAL MUTATIONS:

- *BETTER ADHERENCE HAS BEEN RELATED TO THE DECREASED VIRAL MUTATIONS*

Deeks et al. (1997) Gulick (1988) Moyle (1999) Paterson et al. (1999)

# Other Psychological Variables

## □ COGNITIVE FUNCTIONING:

- *RESEARCH GENERALLY SUGGESTS AN INFLUENCE OF POOR COGNITIVE FUNCTIONING AND POOR ADHERENCE*

Albert et al. (1999)

## □ OTHER POTENTIAL CORRELATES:

- Depression has an inconsistent effect on adherence:

Albert et al. (1999) Andrade et al. (2000) Gordillo et al. (1999) McClure et al. (1999)  
Singh et al. (1999)

# Some thoughts for class discussion:

Should we pay people to adhere to take their drugs?

Do you think it would be effective?

Should we require people to come in to take their drugs under observation?

Understanding adherence requires knowing basic social psychology: motivations, emotions, role of attitudes, knowledge, intentions: how these impact adherence.

Understanding adherence requires knowing basic cognitive limitations: limitations on processing, how memory works and does not.