From Scientific Evidence-Base to Clinical Practice –Drug Use and Drug Use Disorders

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What do we mean by "Evidence-Based"?

"Evidence Based Practice (EBP) is the use of **systematic decision-making** processes or provision of services which have been shown, **through available scientific evidence, to consistently improve measurable client outcomes**. Instead of tradition, gut reaction or single observations as the basis of decision making, **EBP relies on data collected through experimental research and accounts for individual client characteristics and clinician expertise**."

(Evidence Based Practice Institute, 2012; http://depts.washington.edu/ebpi/)

Why Implement Evidence-Based Practices? Advantages

- **Gives clients/patients the best diagnostic and therapeutic interventions and techniques that are available**
- **Offers the possibility to practice in a more effective and efficient way**
- **Provides a more rational basis to make policy decisions**
- **Gives the opportunity to develop a common concept for the evaluation of scientific research**
- **Forms a new basis for education and training, it offers the possibility to achieve continuity and more uniformity of care, and provides more clarification on missing links and shortcomings in our current scientific knowledge (Van Driel et al., 2003).**

Why Implement Evidence-Based Practices? Disadvantages

- **It requires new skills such as use of computer, skills in 'critical reading' and statistical knowledge**
- **It is sometimes perceived as threatening, because deep-rooted customs are questioned (Van Driel et al., 2003).**
- **Puts aside the language of morality for the language of economy: fears that talking about care, dignity and goodness would be pushed aside by talking about advantages, effects and saving costs (Vetlesen & Henriksen, 2003)**

Take Home Messages

- The concept of evidence-based interventions and practice is new.
- There are many issues that have yet to be addressed including:
    - Definitions and criteria for determining what is "evidence-based"
    - Whether the focus is on evidence-based practices or programs
    - Locally vs. research-developed interventions
    - Many gaps in our knowledge-base regarding interventions
    - There is no infrastructure in place to support and sustain evidence-based prevention practices and/or programs.
    - Issues of funding, organization, and management of services

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- **To address any health problem**
  - **Need to prevent onset**
  - **Need to treat affected persons**
- **So we need evidence-based assessments to understand the health problem to begin with so we can delivery appropriate prevention and treatment services**
- **So what do we know about drug use?**
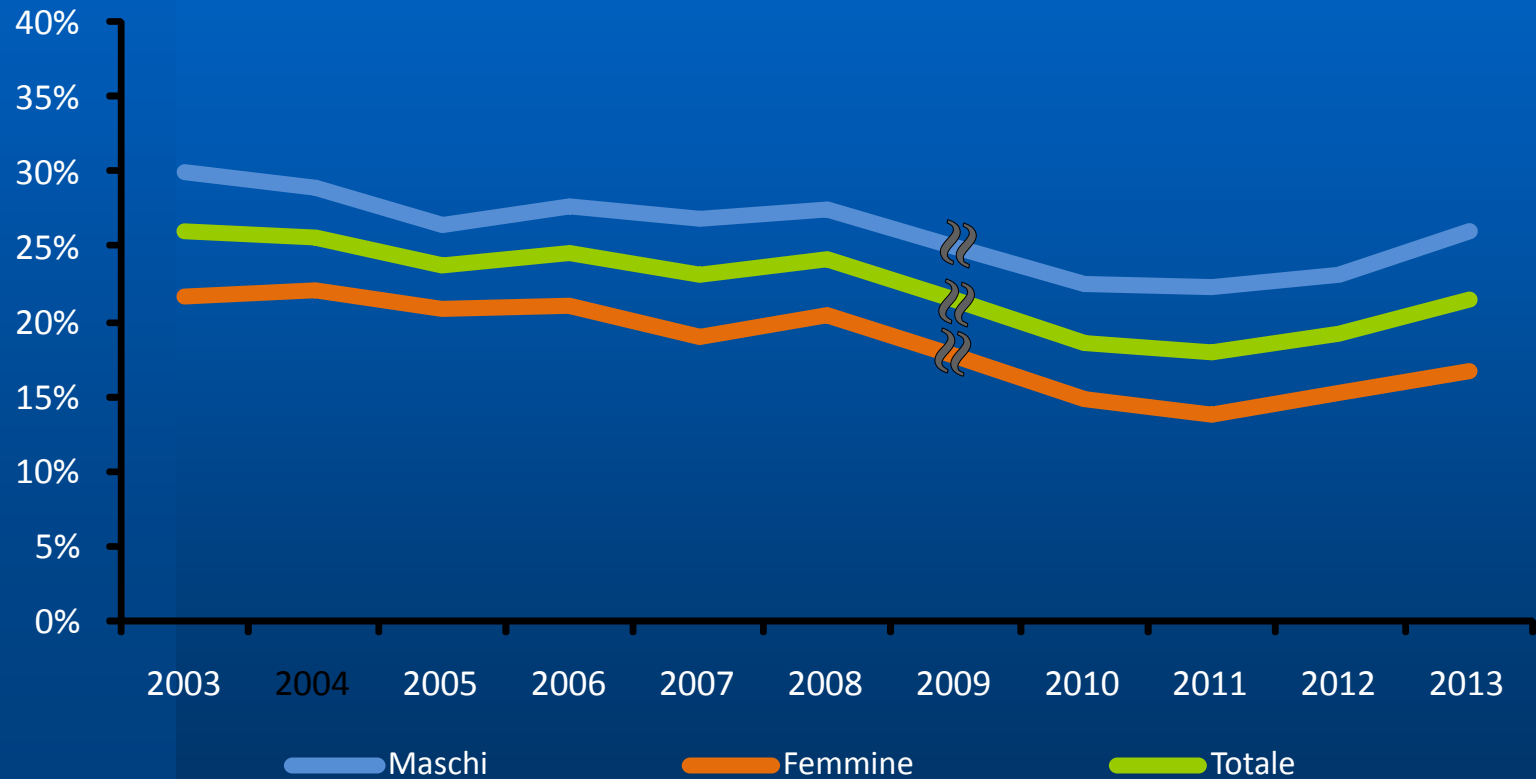
Addressing Drug Using Behaviors

- **Epidemiology**
  - **Incidence—New cases (generally early adolescence)**
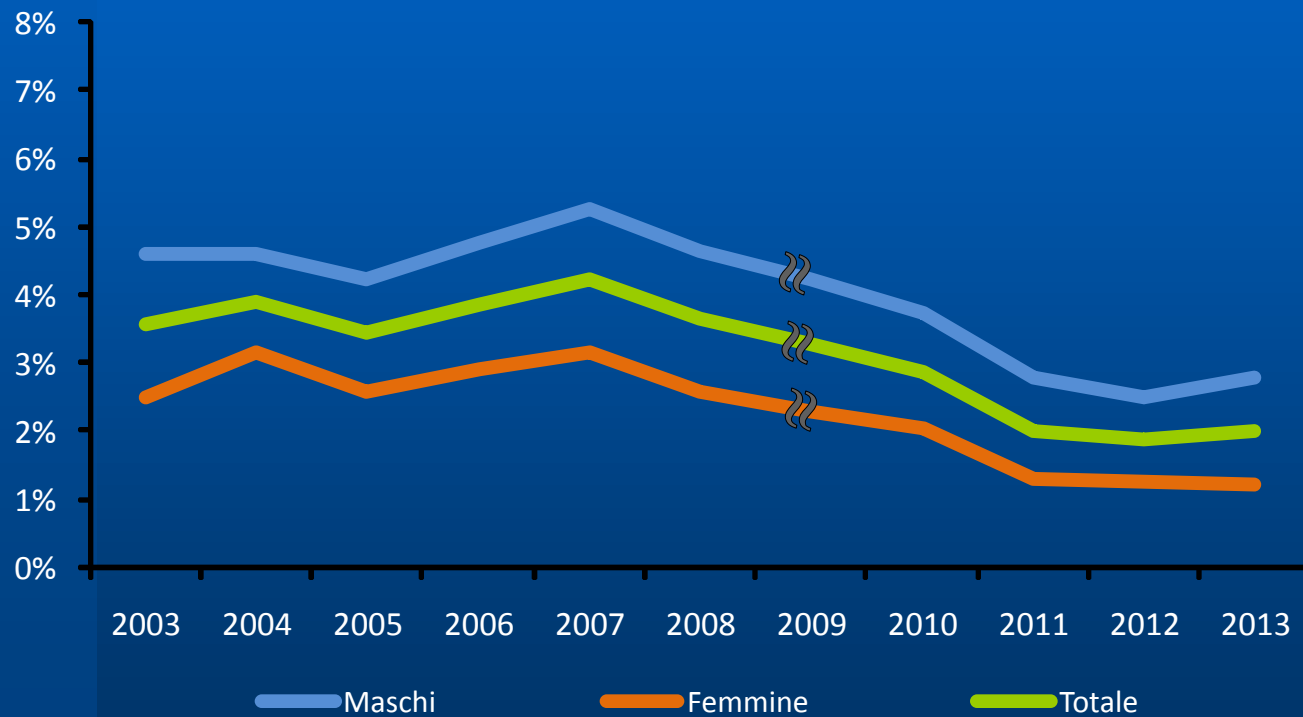 - **Prevalence—Existing cases (including new cases)**
- **Etiology**
- **Natural History—progression and sequelae**

Consumo di cannabis popolazione scolastica 15 – 19 anni (LYP)

Consumo di cocaina popolazione scolastica 15 – 19 anni (LYP)

2011 School Survey, Italy—15-16 Year Olds

- **Cannabis**
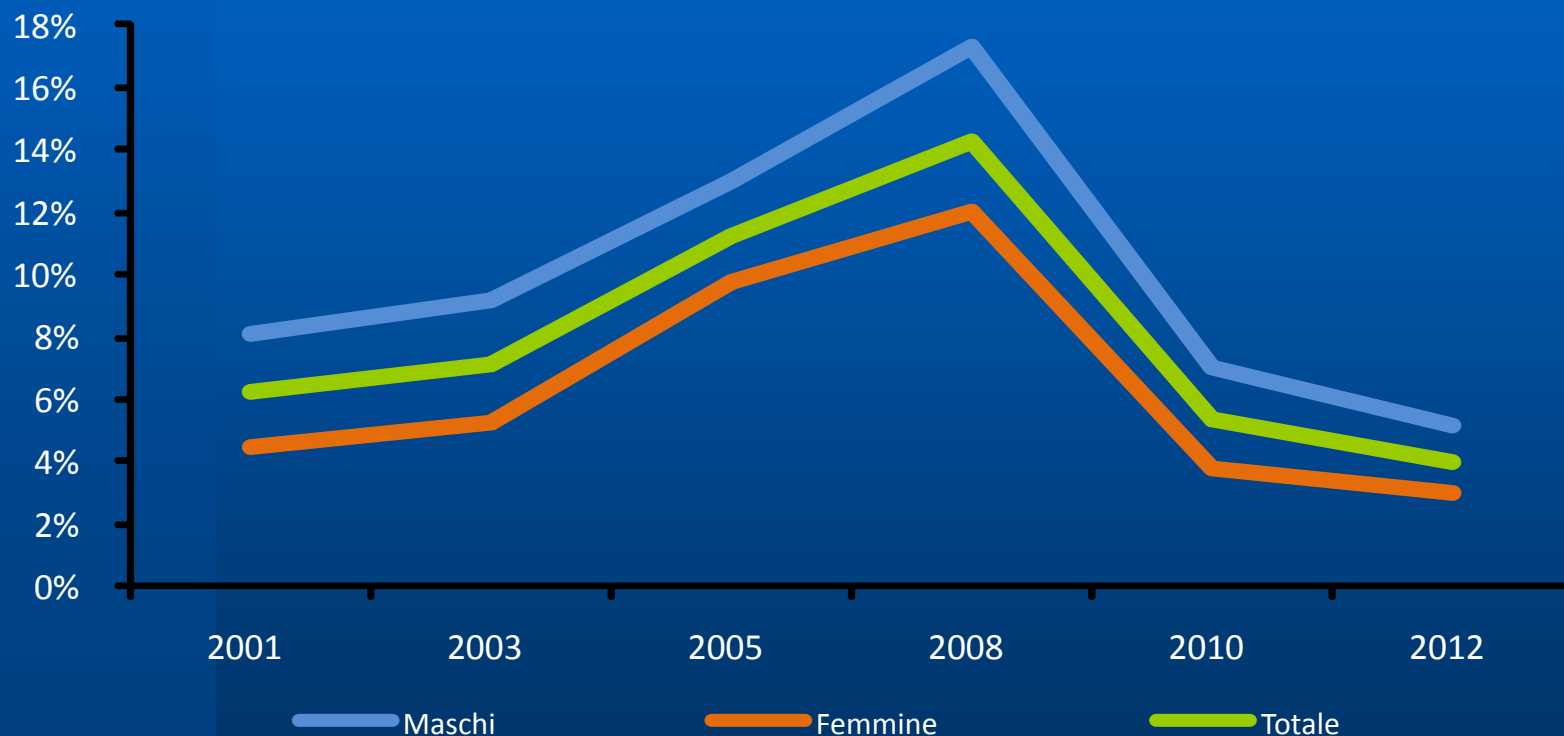 - **lifetime rate dropped from 27 % in 2003 to 21 % in 2011.**
  - **2011—last year 18%**
  - **2011—past 30 days 12%**
- **Other Drugs—2011—Lifetime (ever used)**
  - **Inhalants--3 %**
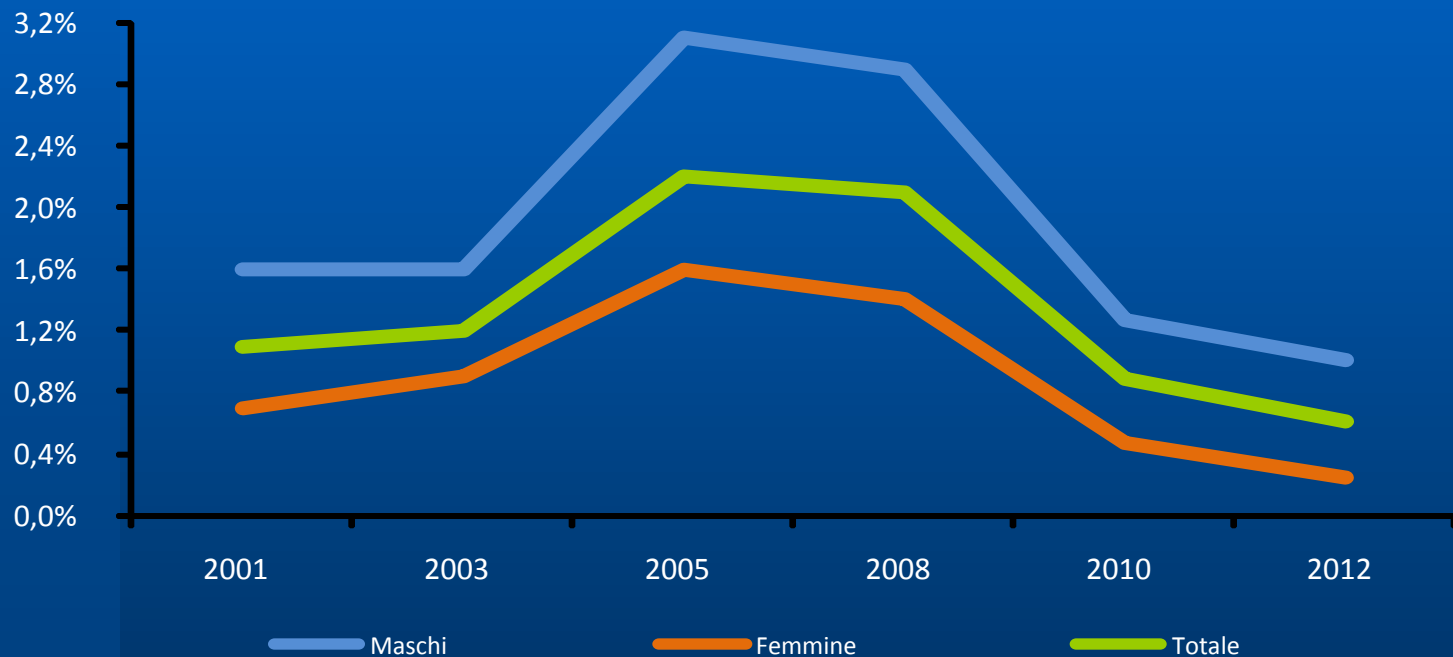 - **Hallucinogens--3%**
  - **Cocaine use--3%**
  - **Amphetamines, ecstasy and heroin--2 %**

Consumo di cannabis popolazione generale 15 – 64 anni (LYP)

Consumo di cocaina popolazione generale 15 – 64 anni (LYP)

Consumo di cannabis studenti 15-16 anni (LTP) (ESPAD)

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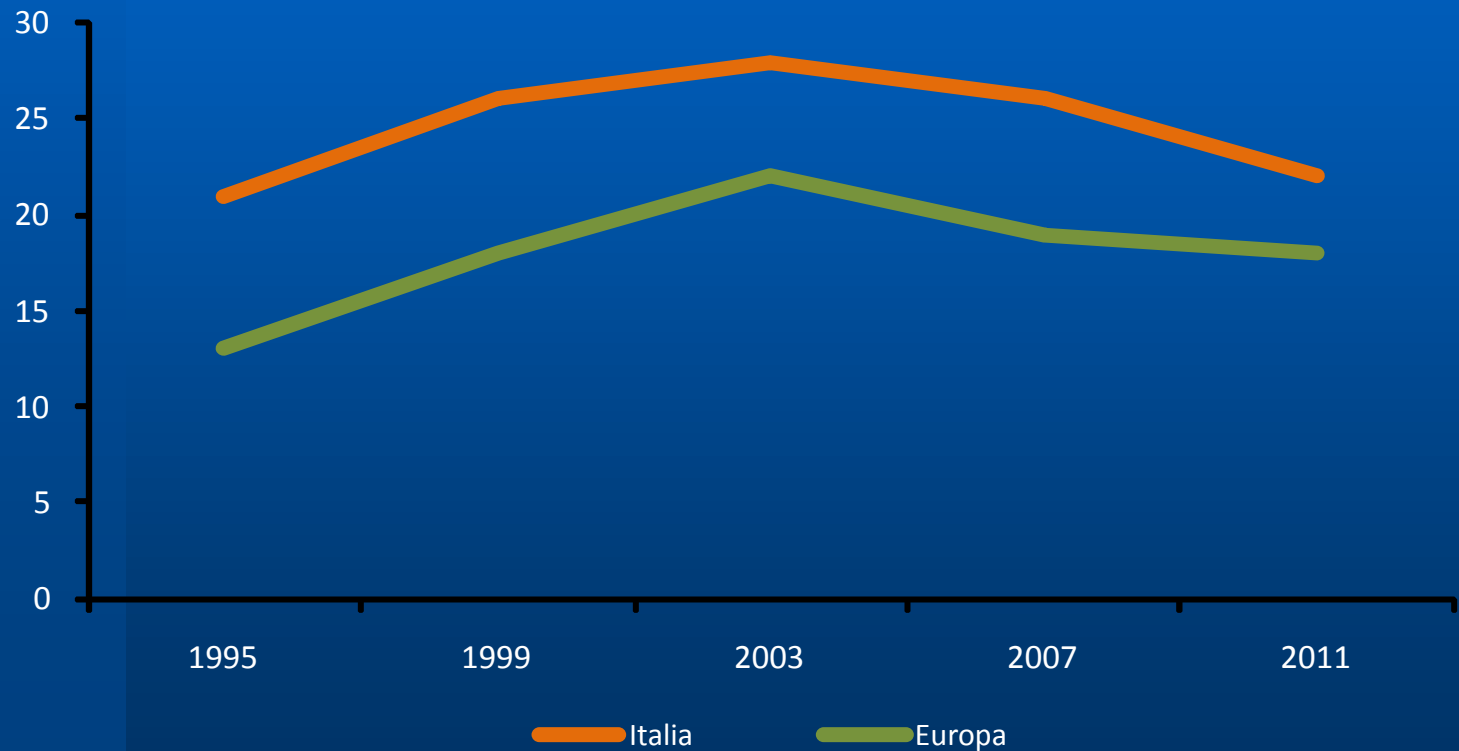
Consumo di cocaina studenti 15-16 anni (LTP) (ESPAD)
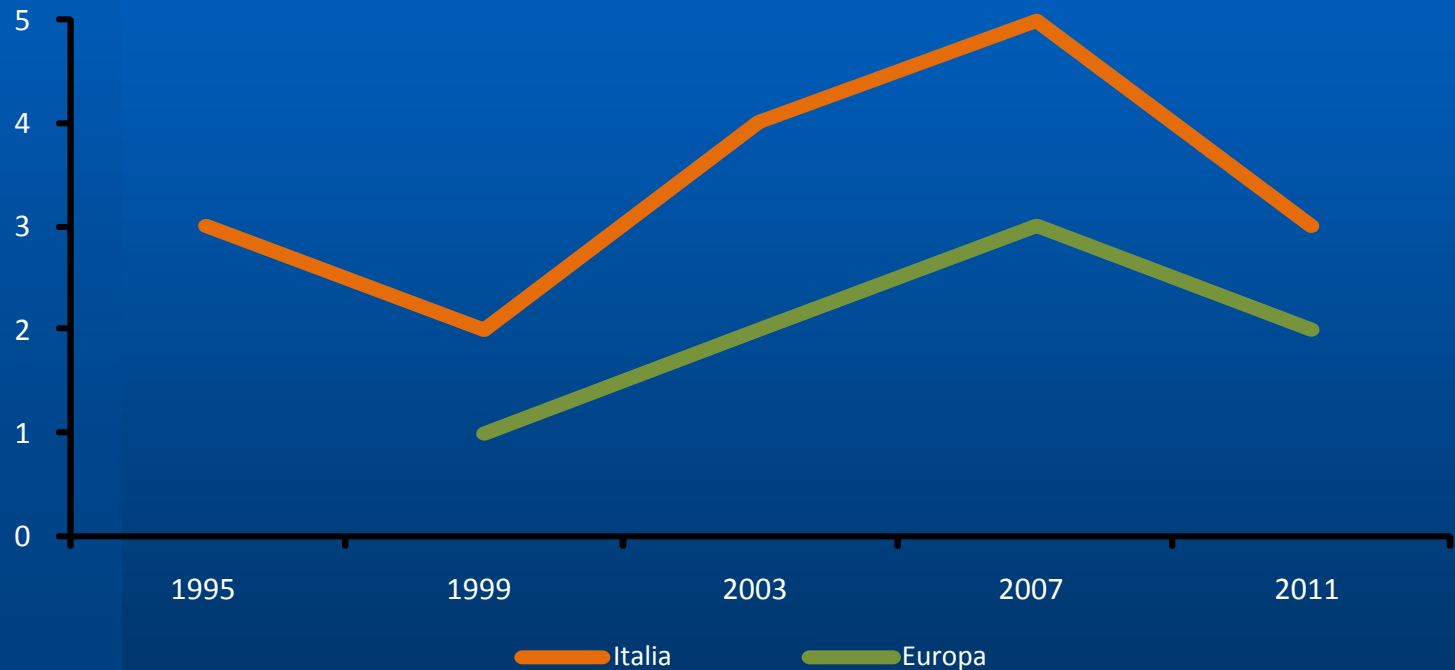
Etiology

- **The term "etiology" has been defined as "… the science that deals with the causes or origin of disease, the factors which produce or predispose toward a certain disease or disorder" (http://www.medterms.com/script/main/art.asp?articlekey=3334).**
- **Applicable to both prevention and treatment**

Natural History of Drug Use/Abuse

Discontinue Use

Initiate Use

Develop Problems
•**Health**
  •**Dependency,**
  •**Infections**
  •**Chronic problems**
  •**Mortality**
•**Emotional, psycho-logical**
•**Social**

Continue Use
-Frequency
-Multiple Drugs
-Varied Administration

No Problems
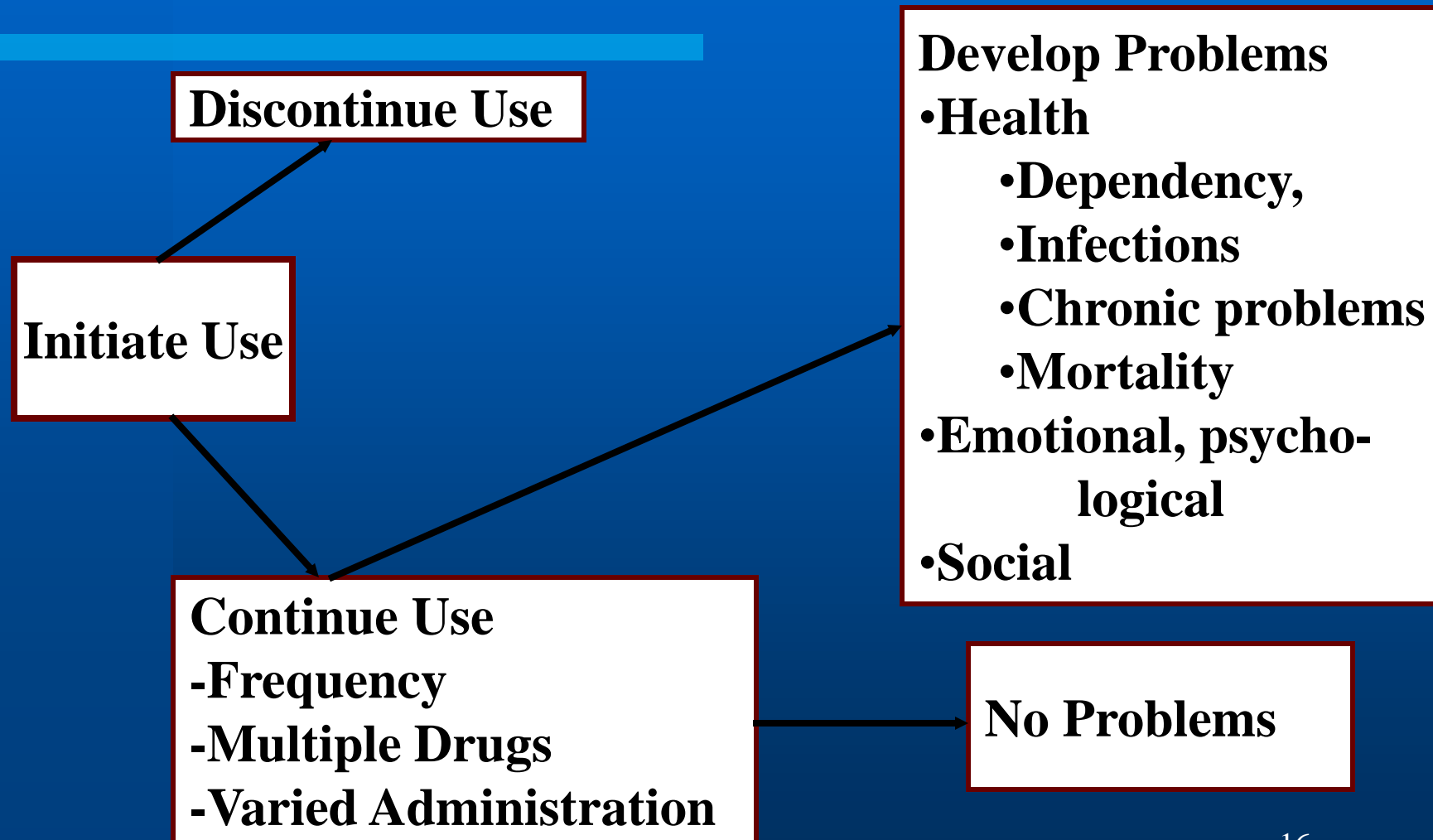
Model of Chronic Distress and Perpetuation of Psychiatric Symptoms and Drug Use in Individuals with Comorbid Disorders
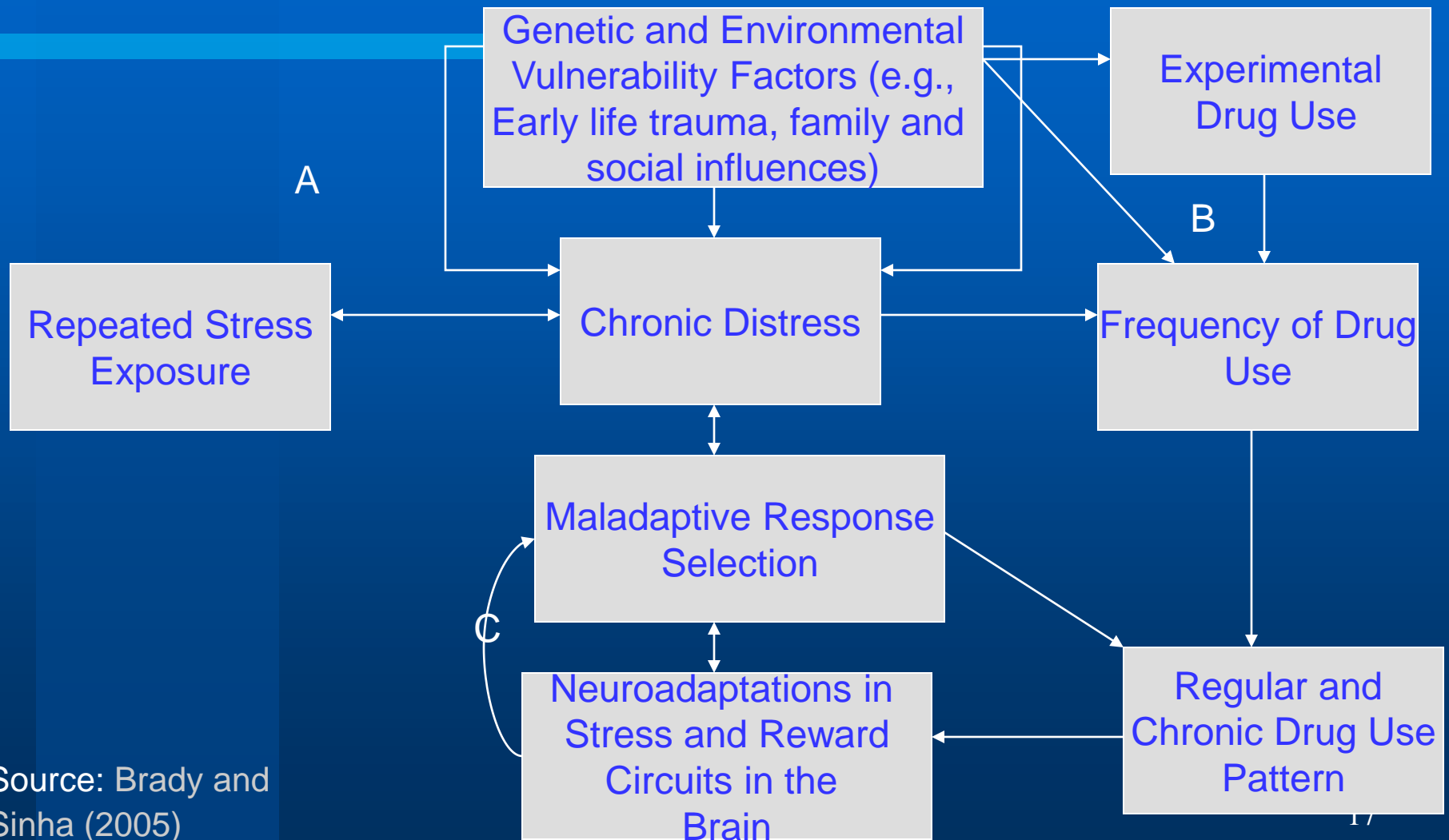
Source: Brady and Sinha (2005)

Spectrum for Mental, Emotional, and Behavior Disorders

Source: Mrazek & Haggerty, 1994)

Drug Use Prevention

Prevention Framework—Risk and Protection

- The framework of "risk" is the focus of most etiological health studies with the presumed understanding that a posited risk is not equivalent to causality

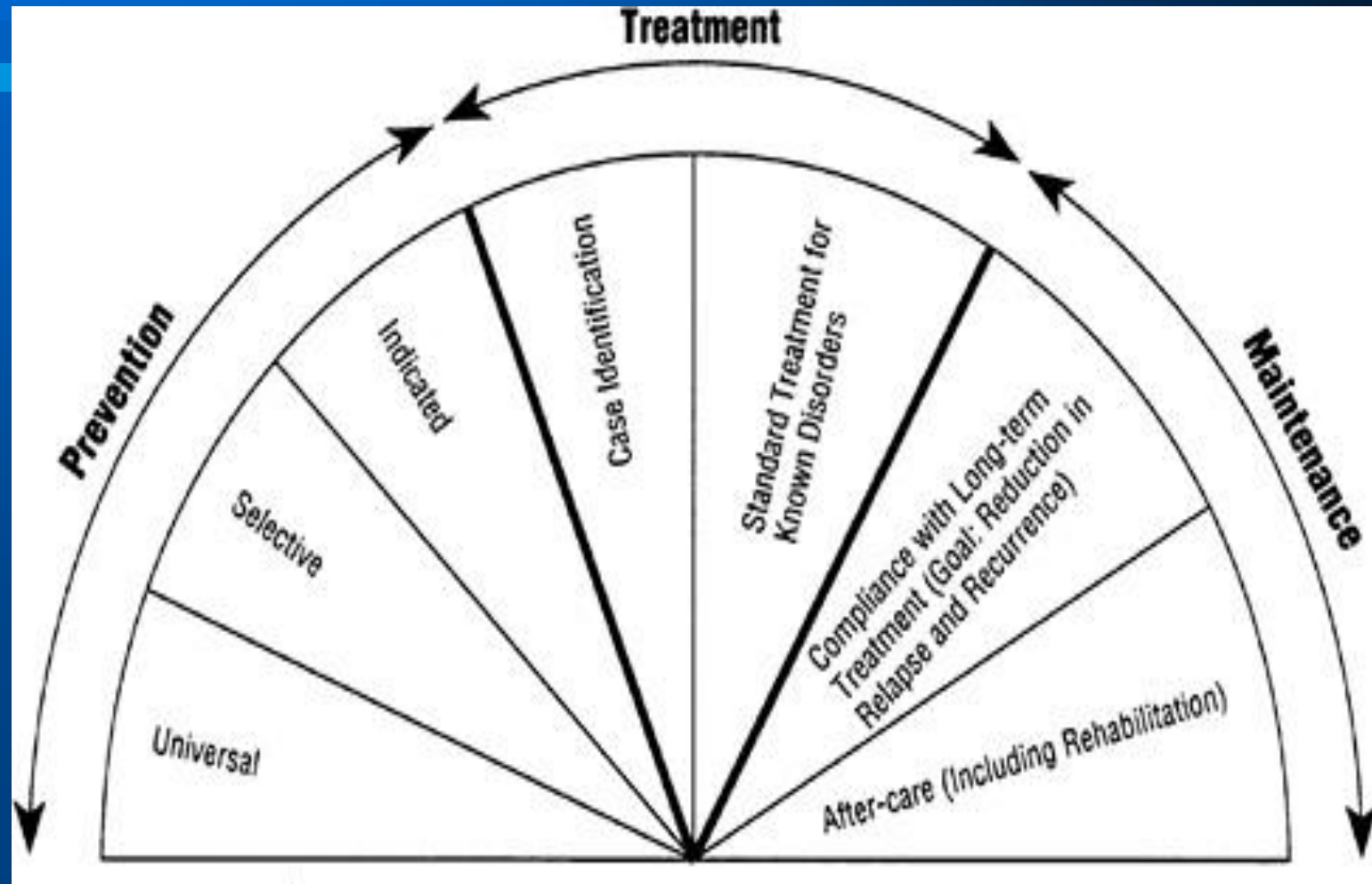- Risk denotes an increased probability of developing a negative health outcome

- Risk=prediction based on theory and/or empirically observed patterns of the increased or decreased likelihood of an outcome given the observation of earlier occurring risk

- Risk and protective factors are usually based on a theory of behavior about large groups of people and/or derived from observations of large groups. Even predictive factors that are useful in the prediction of outcomes for subgroups will not be equally effective for each individual member of the subgroup.

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Risk Factors: Early Childhood-Family

Early Childhood Factors have the longest potential impact as they may interfere with normal and successful development

- Chaotic home environments
- Ineffective parenting
- Lack of mutual attachments and nurturing

Risk Factors: Interactions with socialization agents outside the family

Schools, Peers and Community

- Inappropriate shy and aggressive behavior in the classroom
- Failure in school performance and school bonding
- Poor social coping skills
- Affiliation with deviant peers
- Perceptions of approval of drug-using behaviors

Other Factors Influencing Drug Use

- Availability of alcohol, tobacco and drugs
- Trafficking patterns
- Beliefs that drug use is generally tolerated

Protective Factors For Vulnerable Populations

- Strong family bonds
- Parental monitoring—clear rules of conduct and involvement of parents in lives of children
- Success in school performance
- Strong bonds with prosocial institutions
- Adoption of conventional norms about substance use

Implications of a Risk Framework for Drug Use Prevention
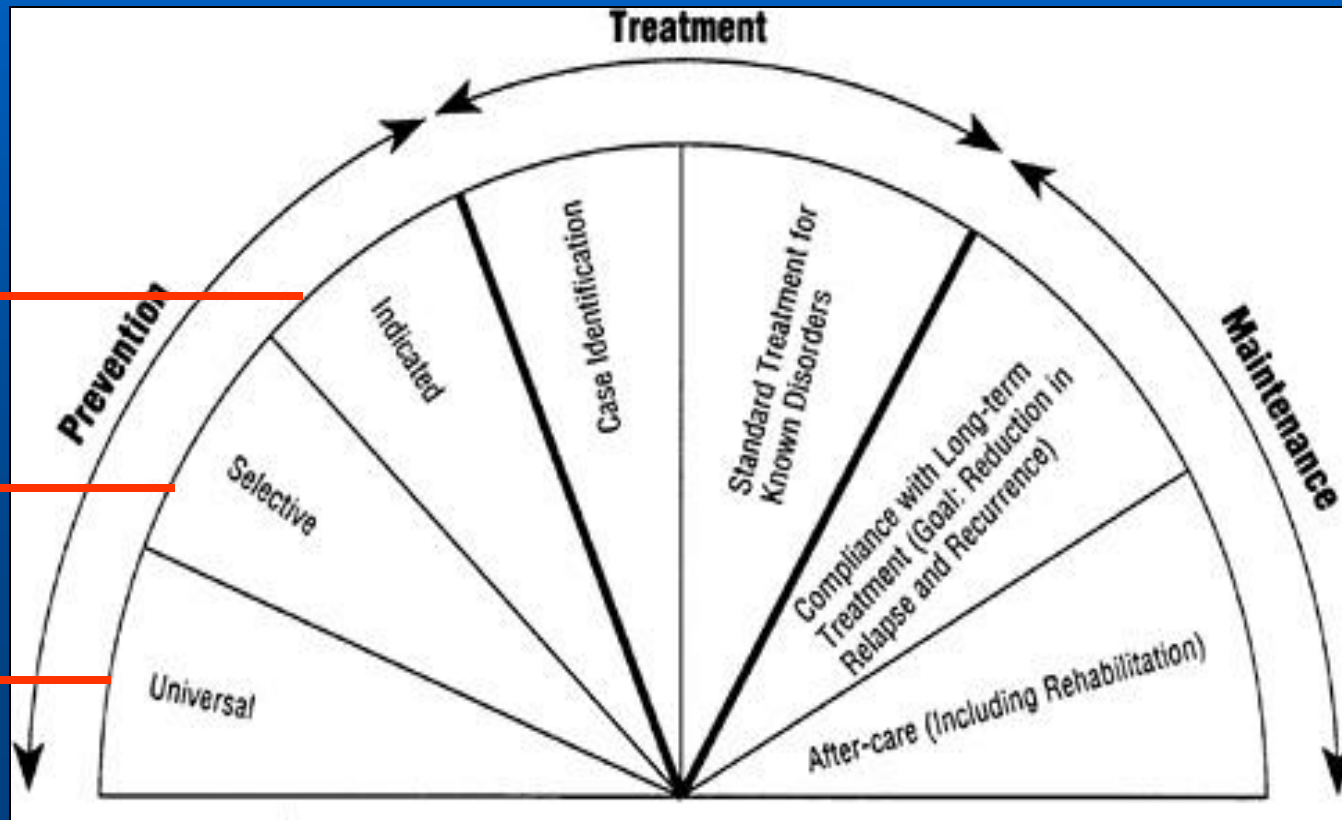
Designed for those who initiated use

Designed for at risk populations

Designed for general populations

Treatment

Prevention

Maintenance

Indicated

Case Identification

Standard Treatment for Known Disorders

Compliance with Long-term Treatment (Goal: Reduction in Relapse and Recurrence)

Selective

Universal

After-care (Including Rehabilitation)

Key Points, New Frontiers, and Challenges

- **Key Points**
  - **New conceptualization of underlying mechanisms**
  - **Focus on individual vulnerability within varying stress-producing environments**
- **New Frontiers**
  - **Neurobiological advances**
  - **New conceptualization of prevention**
  - **Transdisciplinary research**
- **Challenges**
  - **Terminology**
  - **Constructs and measurements**
  - **Research design**

Exploding New Research—Intriguing Directions-Genetics

- **Up to 70% of variance associated with diagnosis of drug abuse disorder or dependence is estimated to be inheritable (e.g., Kendler et al, 2003, Kendler et al., 2007)**
- **100% of genetic variance and 80% of phenotypic variance are shared across different drug and other substance use disorders (e.g., Tsuang et al., 1998)**
- **Influence brain development**
- **Other neurological process associated with onset of drug use disorders and other problem behaviors**

Exploding New Research—Intriguing Directions-continued

- **Neurobiology, Adolescent Brain Development**
  - **Cortex changes and functional reorganization of neural circuitry**
    - Cognitive functioning (decision making, self-monitoring, abstract thinking, forming goal strategies),
    - Behavioral and affective regulation
- **Psychopathology**

Vulnerability Within a Developmental Framework

- **Vulnerability**
  - **Related to achievement of developmental benchmarks—culture-free?**
  - **Neurobiological**
  - **Implies a life-course perspective**
- **But, we know that even the most vulnerable within a positive environment will have good life outcomes**

Nature-Nurture Transaction

- **Proximal environments**
  - **Parenting**
  - **Positive school climate**
- **Distal environments**
  - **Physical neighborhood of residence,**
  - **Social/normative community**

Revisiting Vulnerability and Risk and Protective Factors Within a Developmental Framework

- **Vulnerability**
  - **Related to achievement of developmental benchmarks—culture-free?**
  - **Neurobiological**
  - **Implies a life-course perspective**
- **Risk Factors**
  - **Environmental "triggers"**
  - **Implies opportunities for intervention**

Target of Prevention

- **All this research suggests that the major mechanism for engaging in drug using behaviors is making poor decisions**

- **Environmental circumstances/clues prompt these poor decisions**

-Family structure
-Parenting style
-Perceived parental tolerance of negative behaviors
-Socio-economic status

Perceived school climate
-School Bonding
-Perceived tolerance of negative behaviors

-Peer relationships
-Perceived peer tolerance of negative behaviors

-Social Disorganization
-Perceived neighborhood tolerance of negative behaviors
-Poverty/unemployment

Developmental Markers
-Cognitive Skills
-Executive Functioning
-Language
-Learning and Memory
-Visuospatial

Liability Measure
Interpersonal/environmental
-Family Structure
-Isolation
Intrapersonal (e.g.)
-Novelty Seeking
-Concentration Problems
-Aggression
-Self-Regulation
-Prosociality

Environment
-Family
-School
-Peers
-Neighborhood

Attitudes/Beliefs
-Prosocial attitudes and behaviors
-Normative beliefs
-Perceptions of risk/consequences

Decision-Making

Vulnerability

Outcome Behaviors
-Academic Attainment
-Peer Involvement
-Employment Status
-Legal Status
-Substance Use
-Sexual Health Status

Infancy/Early Childhood

At Age 14/15 and older

Time

Figure 1-Conceptual Transactional Model

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Developmental Challenges

Developmental Period	Context			Neighborhood/ Community
	Individual	Family	School	
Prenatal/Early Childhood	•Exposure to alcohol •Difficult temperament	•Unresponsive mothering •Modeling parental •Substance use		
Middle Childhood	•Lack of behavioral self-control regulation •Aggression •Sensation seeking	•Permissive parenting • Low parental warmth •Harsh discipline •Tolerant of substance •Inadequate monitoring	•School failure •Peer rejection •Low school commitment •Deviant peer group •Peer substance use	•Tolerance of substance use •Accessibility/Avail-ability
Adolescence	•Conduct disorder •Early substance use •Rebelliousness •Low college aspirations •See above	•See all above	•See all above	•See above
Late Adolescence/ Early Adulthood	•Lack of commitment to conventional adult roles •Anti-social attitudes/behavior	•Leaving home	•Association with deviant peers	•See above
Adulthood	•Prior substance use •Difficult transitions	•Detached from family	•See above	•See above

What are Prevention Interventions for Drug Use?

Preventive interventions include-- programs, policies, and practices encompassing:

- intentional actions (whether a singular action or a constellation of actions),
- designed for an individual, organization, community, region, or system,
- which are intended to alter substance use behaviors,
- address risk or protective factors, and
- improve health-related outcomes (CDC 2007; Rabin et al. 2008; Spoth et al., 2013).

Prevention Programs—Composed of…

- **Integration of principles or key elements of prevention**

- **Developmentally and culturally relevant messaging**

- **Appropriate instructional strategies when relevant (e.g., media messages, school-based curriculum)**
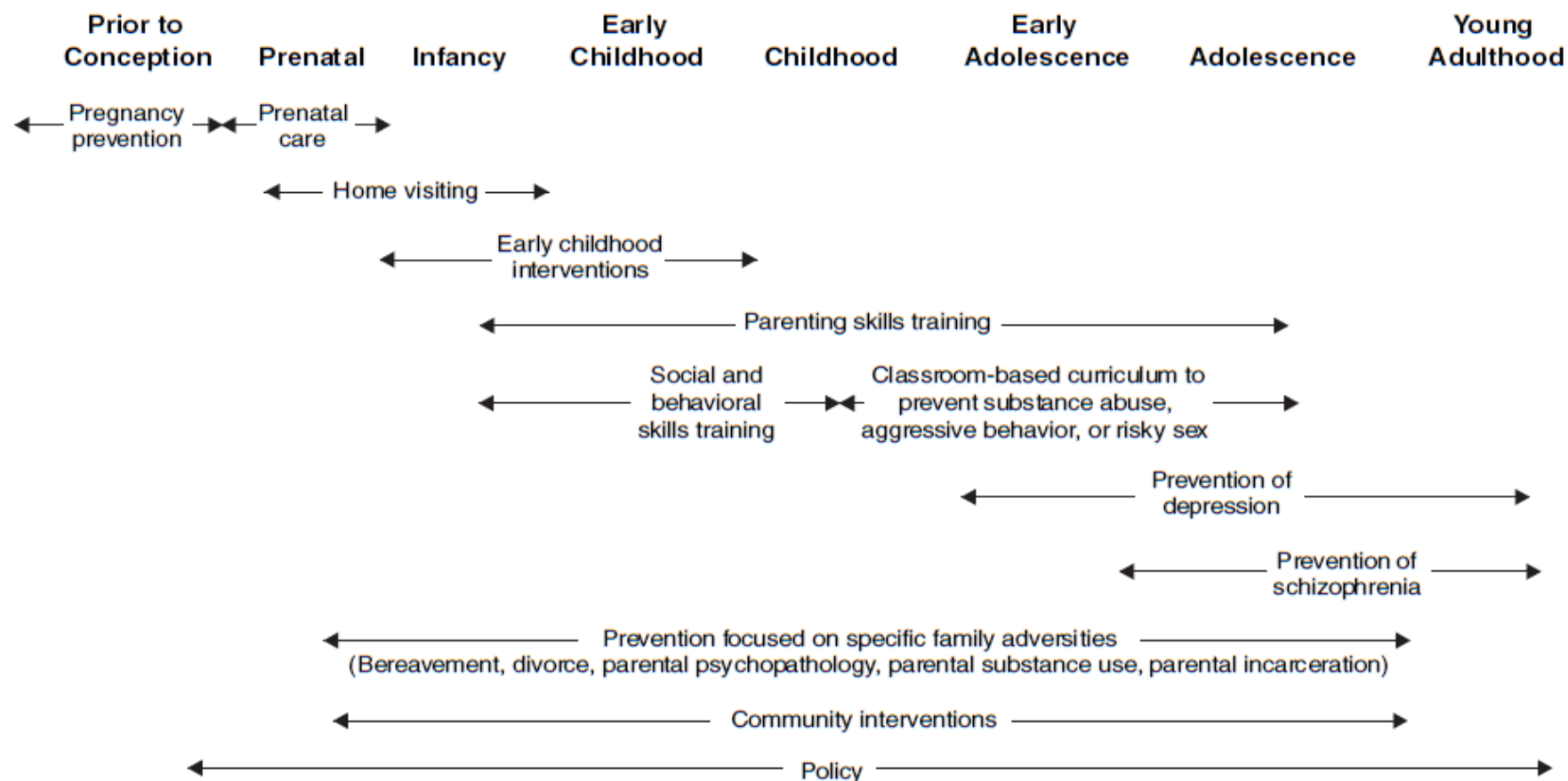
Interventions by Developmental Phase

FIGURE II-1 Interventions and their targeted developmental stages.

Evidence-Based Concepts in U.S.—Not Standardized

- **Criteria developed in 2005 by the Society for Prevention Research: Standards of Evidence**

- **Criteria developed in 2009 by the Center for Substance Abuse Prevention: Identifying and Selecting Evidence-Based Interventions**

- **National Institute on Drug Abuse--Principles of Prevention**

- **Lists of Evidence-Based Drug Abuse Prevention Interventions**

Efforts to take effective prevention to scale—CSAT/NIDA

- National Centers for the Application of Prevention Technologies (CAPT)

- Strategic Prevention Framework State Incentive Grant (SPF SIG)

Real World--Studies

- **In 2002; it was found that only 19% of school districts across the country were implementing a "research-based" curriculum with fidelity (Hallfors and Godette ; 2002)**

- **In 2005, 42.6% of middle schools (grades 5-8; ages 11-14) used an evidence-based program; up 8% from 34.4% in 1999 (Ringwalt et al; 2009)**

- **In 2005, 10.3% of high schools (grades 9-12; ages 15-18) used evidence-based programs (Ringwalt et al;, 2008)**

Real World--Studies

- **Over the period of 2001 through 2006, in a sample of 103 middle and high schools, 36.5% of schools offered a "named" program in the 7th grade dropping to 10% in high school**

- **In addition, many substance use non-evidence – based prevention activities were made available to students including in class lessons, assemblies, and group activities: 49.2% of schools offered these activities in 7th grade with increases to 80% when students were in the 11th grade (Sloboda et al., 2008)**

UNODC
United Nations Office on Drugs and Crime

International Standards on Drug Use Prevention

Intent of the International Standards

- **To summarize the currently available scientific evidence, describing effective interventions and policies and their characteristics.**

- **To identify the major components and features of an effective national drug prevention system.**

- **Ultimately, to help policy makers worldwide to develop programmes, policies and systems that are a truly effective investment in the future of children, youth, families and communities.**

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- **This work builds on and recognizes the work of many other organizations (e.g. EMCDDA, CCSA, CICAD, Mentor, NIDA, WHO) which have previously developed standards and guidelines on various aspects of drug prevention.**

Main sections of the Standards

- **Introduction to drug prevention and drug prevention science**
- **Evidence-based interventions and policies**
- **Components of a national drug prevention system**

How is the evidence collected?

- **Group of experts (80) identified relevant references for us. Important to note, experts were:**
  - **Nominated by UNODC and Member States**
  - **Researchers, practitioners, policy makers**
  - **Geographically representative**
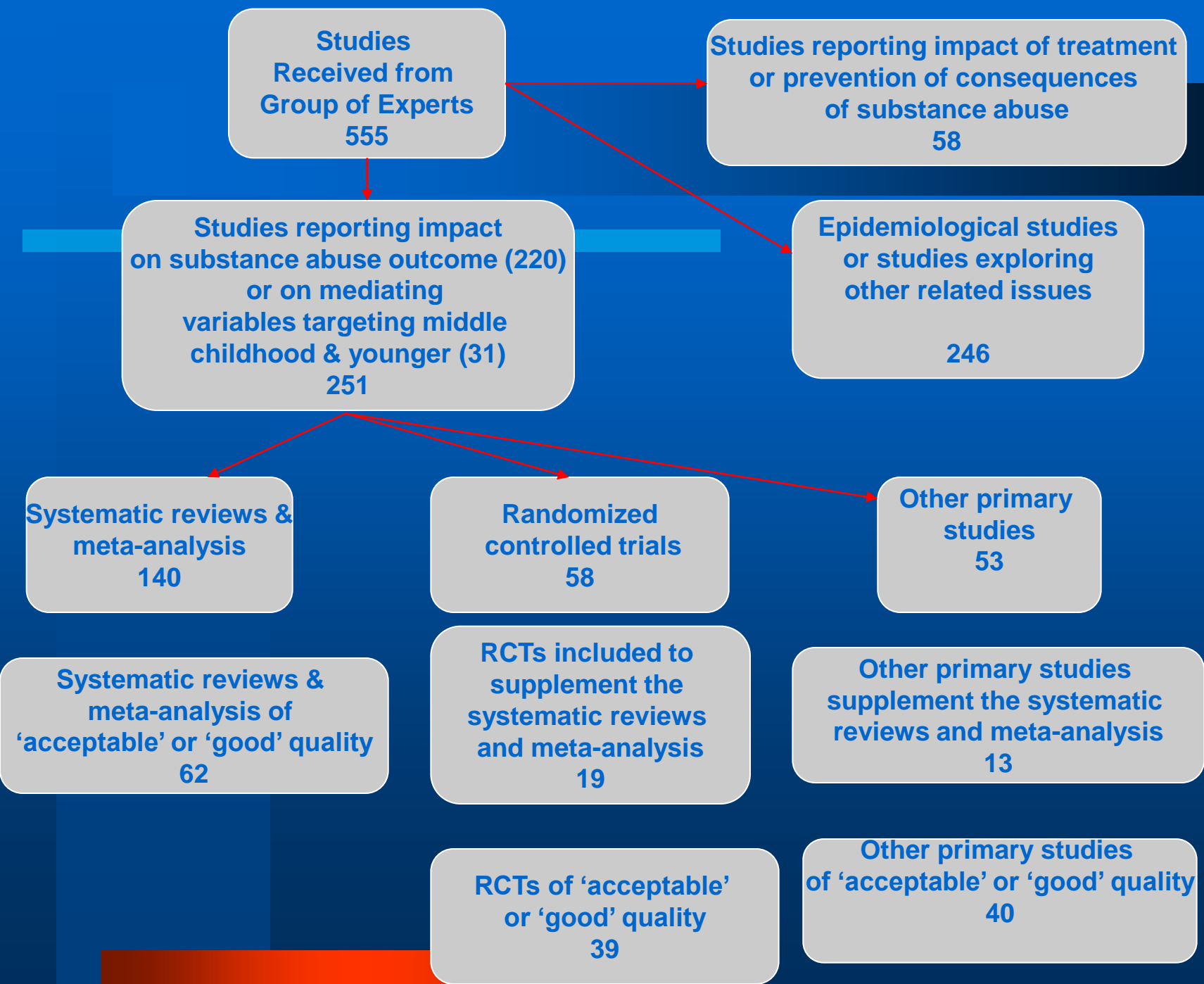
Effective drug prevention interventions & policies

	Prenatal & infancy	Early childhood	Middle childhood	Early adolescence	Adolescence	Adulthood
Family	Nurse visitation during pregnancy & infancy ★★		Parenting skills ★★★★			
	Selective Dependence treatment for pregnant women ★					
School		Early childhood education ★★★★	Personal & social skills ★★★	Personal & social skills & social influences education ★★★		
			Classroom management ★★★		Addressing individual vulnerabilities ★★	
			Policies to keep children in school ★★	School policies & culture		
Community				Alcohol & tobacco policies ★★★★★		
	Community-based multi-component initiatives ★★★					
				Media campaigns ★★		
				Mentoring ★		
Workplace					Workplace prevention ★★★	
Health sector				Brief intervention ★★★★		

Infancy and early childhood

- **Children's earliest interactions occur in the family before they reach school**

- **Physical, cognitive, and, emotional development is closely linked to parenting style.**

- **During this developmental period children develop strategies and emotional experiences to cope with novelty and threats that form the basis for how they relate to their environment as they grow.**

# Infancy and early childhood interventions and policies

Intervention	Level of risk targeted	Strength of evidence	Indication of efficacy
Dependence treatment for pregnant women	**Selective** Groups at risk	**Strong** Two good reviews	★ Limited
Prenatal and infancy visitation	**Selective** Groups at risk	**Good** More than one good RCTs	★★ Adequate
Early childhood education	**Selective** Groups at risk	**Strong** Two good reviews	★★★★ Very good
Community-based multi-component initiatives			

Drug Abuse Treatment

Targets of Treatment

- Dependence
- Addressing underlying etiologic factors
- Addressing life skills and competencies
  - Early vs. late onset
- Recognition that drug abuse is a chronic, relapsing brain disorder
- Acknowledgement of the influence of environmental factors on 'craving' and cues to use drugs

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Spectrum for Mental, Emotional, and Behavior Disorders

Source: Mrazek & Haggerty, 1994)
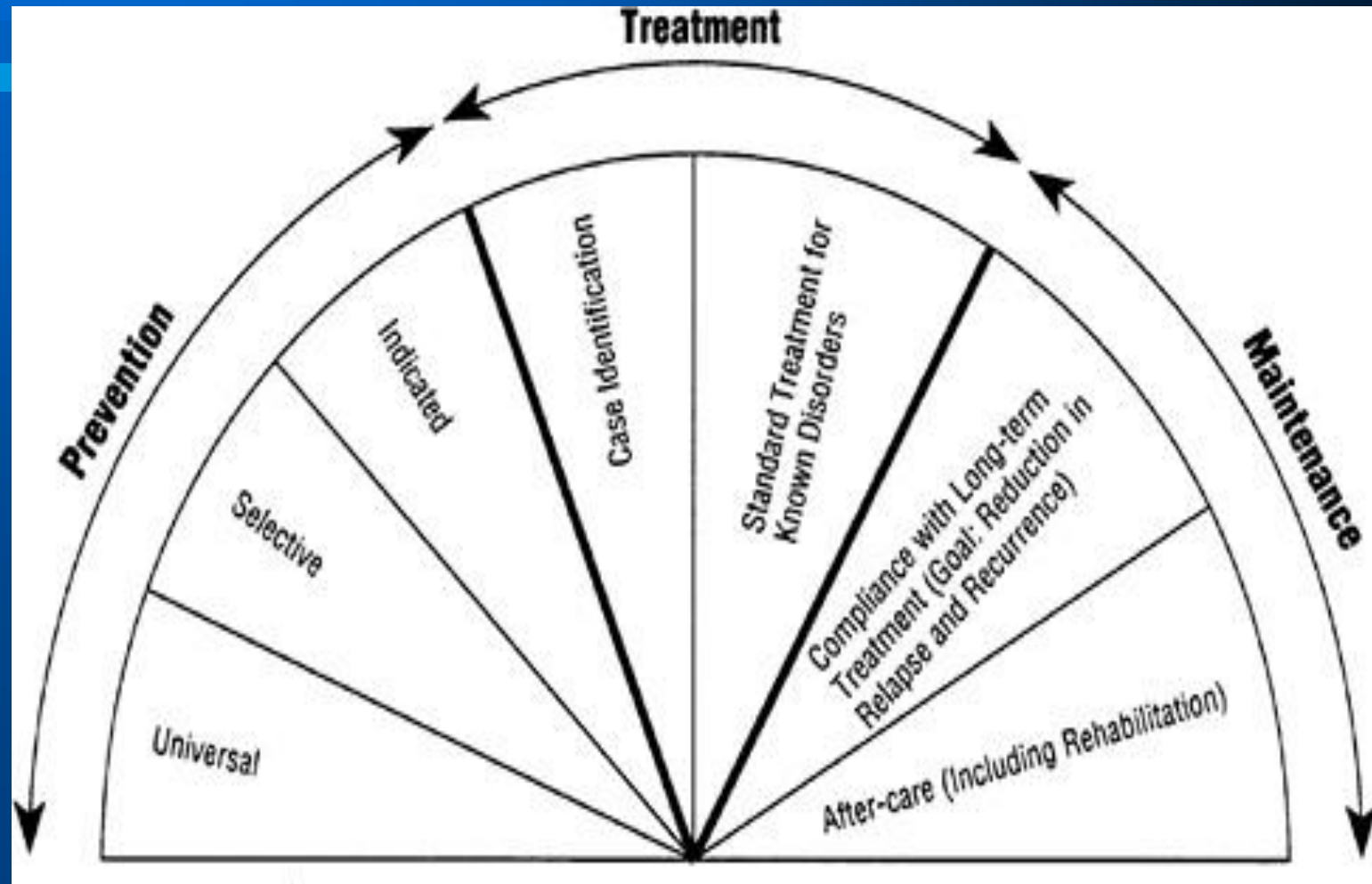
The 1990s—Summary of findings from two decades of research

- **Controlled efficacy studies**
- **Evaluations of existing treatment**

What was found in evaluations of existing treatment programs?

- **Positive outcomes associated with:**
  - Staying longer in/ being more compliant with treatment—especially through behavioral contracting for positive reinforcement;
  - Having an individual counselor or therapist;
  - Having specialized services provided for associated medical, psychiatric, and/or family problem;
  - Receiving proper medications—both for psychiatric conditions and anticraving medications; and
  - Participating in AA or NA following treatment

Evidence-Based Concepts in U.S.—Not Standardized

- **National Institute on Drug Abuse--Principles of Effective Treatment-2012**

- **Consensus Recommendations: Ziedonis, D.M. et al., (2005) Journal of Psychiatric Practice, 11(5): 315-339**

- **Evidence-Based Treatment Model- Simpson, 2001 (<u>Addiction</u>)**

- **Consensus Standards Reached on 11 Evidence-Based Practices for Substance Abuse Conditions—Robert Wood Johnson Foundation**

PRINCIPLES OF
DRUG ADDICTION
TREATMENT

A RESEARCH-BASED GUIDE

SECOND EDITION

National Institute on Drug Abuse
National Institutes of Health
U.S. Department of Health and Human Services

Third Edition 2012

Principles of Effective Treatment—(National Institute on Drug Abuse--2012)--Examples

1. **Addiction is a complex but treatable disease that affects brain function and behavior.**
2. **No single treatment is appropriate for everyone.**
3. **Treatment needs to be readily available**
4. **Effective treatment attends to the multiple needs of the individual**
5. **Treatment plans must be assessed and modified continually to meet changing needs**
6. **Remaining in treatment for an adequate period of time is critical for treatment effectiveness**

13. **Recovery can be a long-term process and frequently requires multiple episodes of treatment**

- **NIDA (2012)** *Principles of Drug Addiction Treatment*

Consensus Recommendations: Ziedonis, D.M. et al., (2005) Journal of Psychiatric Practice, 11(5): 315-339

- **Screening and Assessment**
- **Common Medical Consequences of Substance Use**
- **Assessing and Managing Medical Consequences of Substance Use**
- **Treatment Plan Development**
- **Psychosocial Approaches**
- **Medication Management**
- **Key Agency or Systems-Level Issues**

Evidence-Based Treatment Model

Simpson, 2001 (Addiction)

Scientifically Based Approaches to Treatment

- **Relapse Prevention**
- **Supportive-expressive Psychotherapy**
- **Individualized Drug Counseling**
- **Motivational Enhancement Therapy**
- **Multidimensional Family Therapy**
- **Behavioral Therapy**
- **Multisystemic Therapy**
- **Combined Behavioral and Nicotine Replacement Therapy**
- **Community Reinforcement Approach Plus Vouchers**
- **Voucher-Based Reinforcement Therapy in MM Treatment**
- **Day Treatment with Abstinence Contingencies and Vouchers**
- **The Matrix Model**

What was done to address the need to transfer knowledge about effective treatment in the US? Examples: CSAT/NIDA

- **The Knowledge Application Program (KAP**
  - **The Treatment Improvement Protocol (TIP) series,**
  - **Technical Assistance Publications (TAPs), treatment and training manuals for providers**
- **Medication Assisted Treatment (MAT)**
- **Addiction Technology Transfer Centers (ATTCs)**
- **Treatment Improvement Exchange Forum (TIE)**
- **Clinical Trials Network (CTN)**

BUT……. In the United States---

- **Treatment programs have not adopted useful research findings into clinical practice (e.g., minimal use of methadone and naltrexone, contingency management)**

- **Morale of staff in treatment programs is low**

- **Services provided have been reduced over time.**

Continued

- **Too few drug abusers attracted to treatment**
- **Rates of illicit drug use by clients in treatment are unacceptably high**
- **Clients are not clinically matched with treatment programs, e.g., psychiatric severity**
- **Treatment retention rates are too low**
- **Relapse rates after treatment are unacceptably high**

Real World

- **Recent studies (D'Anno & Pollack, 2002; D'Anno et al., 1999; Friedman et al., 2003) are showing indications of improved service delivery**

- **Concerted efforts on the parts of federal and state agencies and professional groups to enhance treatment services through training, organizational structuring, funding requirements**

Treatment services availability

	1990	2002
Number	16,000	14,000
Residential/Inpatient	55%	14%
Outpatient/Drug Free	30%	78%
Methadone Maintenance	15%	12%

Source: McLellan et al., 2003

What's Happening in Italy?

- **Italy's electronic health record system, Multi Functional Platform**
  - **In use in 150 opioid-agonist treatment facilities in 8 regions**
  - **Provides opportunities to monitor treatment practices**

  Source: Serpolloni et al., 2013, Journal of Substance Abuse Treatment doi.10.1016/j.jsat.2013.02.001

Common Issues to Prevention and Treatment

- **Public, policy makers, other professionals including practitioners are not aware of**
  - the availability of effective preventive and treatment interventions
  - the science behind prevention and treatment
- **Lack of formal training in addiction science**
- **Drug policies driven by ideology and not sustained**
- **Changing patterns of drug use and abuse**
- **Fidelity versus Adaptation**

Issues Specific to Prevention

- **Lack of an infrastructure to support prevention programming at the community level**
- **No clear identification or site for prevention outside of schools**
- **Erratic funding**
- **Need for licensed prevention specialists with standardized training and opportunities for career progression**
- **Processes related to the selection of prevention programs is not understood**
- **Lack of evaluation studies of ongoing "real world" prevention programming**

Issues Specific to Treatment

- **Ideology of policy makers and providers of treatment**
- **Stigma associated with substance abusers, particularly illicit drugs and alcohol**
- **Resistance to change**
- **Funding limitations driven by ideology and not evidence-based practices**

- **Building International Collaborative Research on Drug Abuse: Improving Evidence-Based Treatment**
  - **June 14-17, 2013—San Diego, CA**
  - **Sponsored by**
    - **the U.S. National Institute on Drug Abuse**
    - **The Australasian Professional Society on Alcohol and Other Drugs**
  - **Presentation by Dr. Giovanni Serpolloni, Department of Anti-Drug Policies**

Integration of Services Research and Implementation Sciences
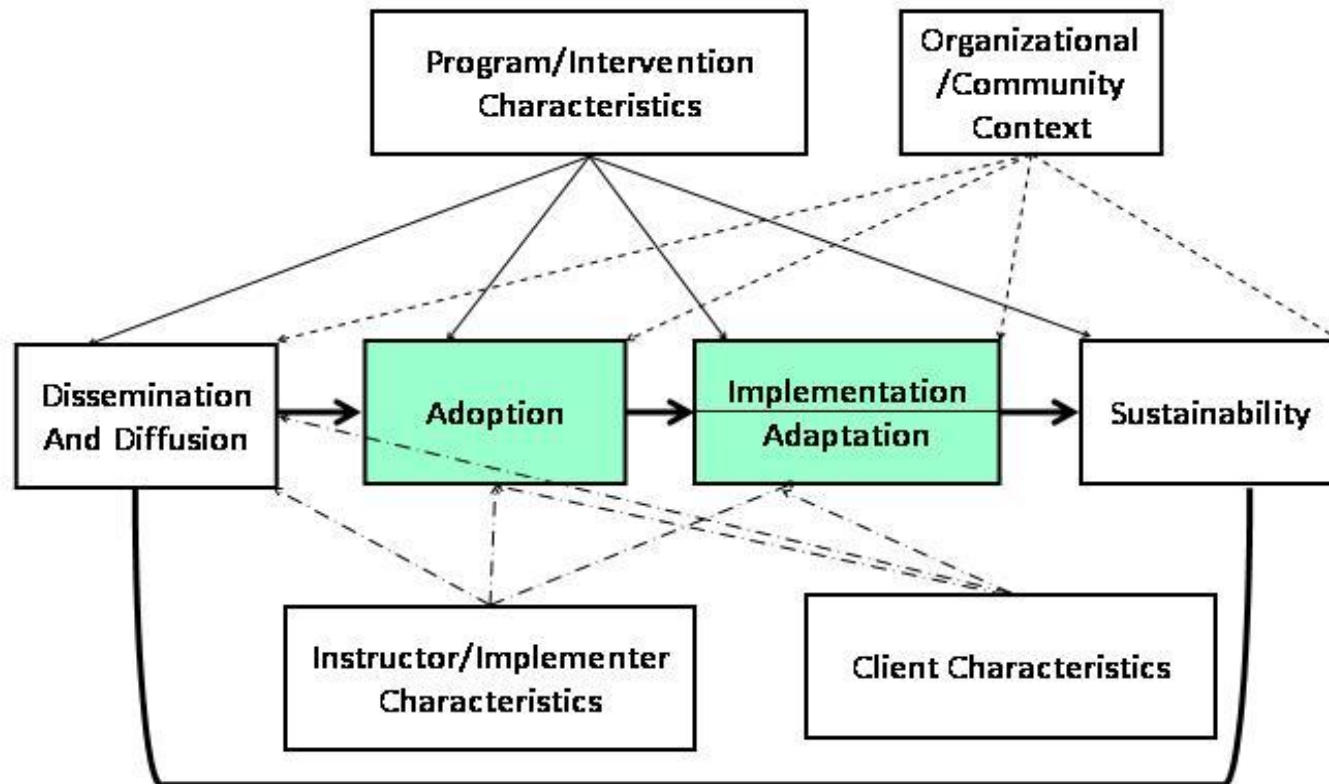
Thank you
for you attention

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