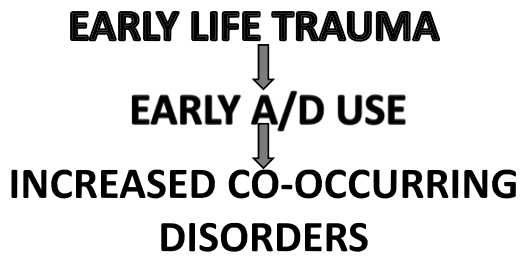
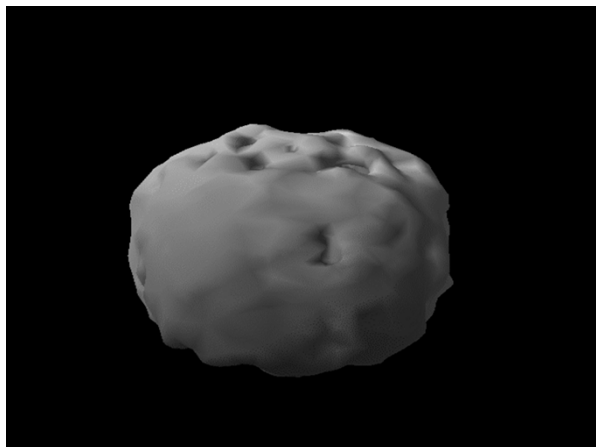


**THE MULTI-SYSTEM
MULTI-PROBLEM CLIENT**

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AN UNFORTUNATE PROGRESSION





THE PREFRONTAL CORTICES (PFC)

- **DORSOLATERAL PREFRONTAL CORTEX**
- **ORBITOFRONTAL CORTEX**
- **ANTERIOR CINGULATE GYRUS**

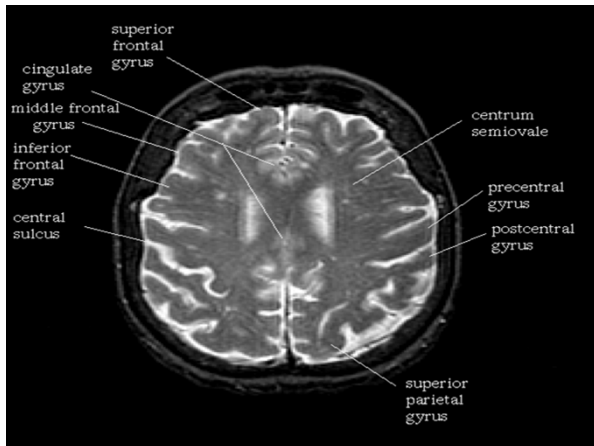
Therapist task-optimize plasticity

The Prefrontal Cortices

- **COORDINATE THE MANY BRAIN ACTIVITIES NEEDED TO UTILIZE:**
 - **EXECUTIVE FUNCTIONS**
 - Set goals
 - Make plans to attain those goals
 - Organize steps to carry out the plans
 - Ensure that desired outcomes are achieved
 - **CONSCIENCE**
 - **PURSUE REWARD WITHIN THE LAW**

ANTERIOR CINGULATE GYRUS

- **COORDINATES**
 - Maternal behavior
 - Nursing
 - Play
- **DETECTION OF ERROR**
- **ALLOCATES ATTENTION TO WHAT IS MOST SALIENT**
- **MOTIVATES GOAL-DIRECTED BEHAVIOR**

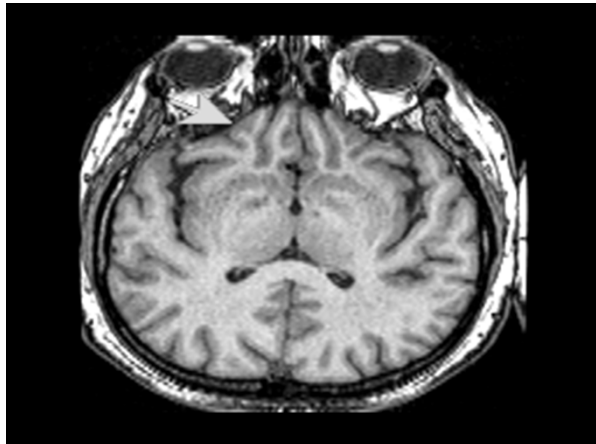


ANTERIOR CINGULATE GYRUS

- DEFICITS
 - DECREASED MATERNAL BEHAVIOR
 - DECREASED EMPATHY
 - DECREASED EMOTIONAL STABILITY
 - INCREASED RESPONSE TO STRESS
 - INAPPROPRIATE SOCIAL BEHAVIOR
 - IMPULSIVITY

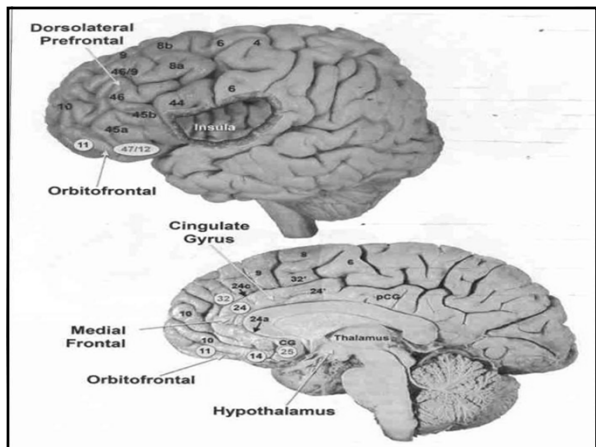
ORBITOFRONTAL CORTEX (OFC)

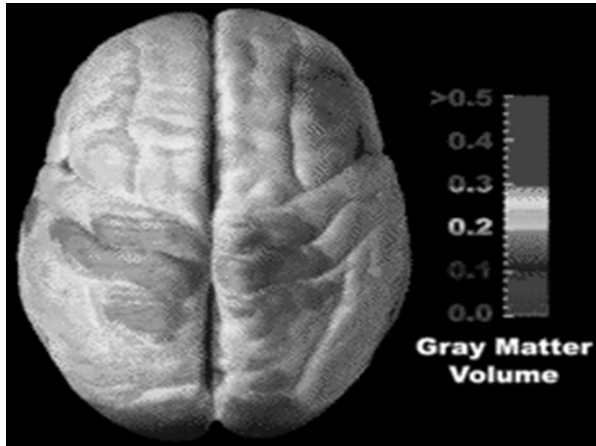
- ORBITOFRONTAL CIRCUIT
 - MODULATES PURSUIT OF REWARD
 - Risk
 - Context
 - Potential consequences
 - SENIOR EXECUTIVE OF THE EMOTIONAL BRAIN
 - REGULATES INTERPERSONAL AND SOCIAL BEHAVIOR
 - EARLY DEVELOPMENTAL TRAUMA NEGATIVELY IMPACTS OFC



DORSOLATERAL PREFRONTAL CORTEX

- DORSOLATERAL CIRCUIT
 - MODULATES EXECUTIVE FUNCTIONS
 - Organization
 - Problem Solving
 - Working Memory
 - Memory Retrieval
 - Self-directedness
 - Ability to address novelty
 - Use of language to guide behavior





The Prefrontal Cortices

PFC plastic especially between 0-5 and 10-20 years of age

Developmental delays occur secondary to early life trauma and early onset alcohol/drug abuse.

PFC CRITICAL TO BECOMING RESILIENT

NEUROPLASTICITY AND THE PFC

- WHAT CAN WE TREAT?

Cognition

Affect

**PEER AND PARENTAL
RELATIONSHIPS**

NEUROPLASTICITY

- PREADOLESCENT AND ADOLESCENT NEUROBIOLOGICAL THEMES
 - BRAIN CELLS, CONNECTIVITY, RECEPTORS AND NEUROTRANSMITTERS PEAK IN CHILDHOOD AND ARE REDUCED DURING ADOLESCENCE
- CONNECTIVITY AMONG BRAIN REGIONS INCREASE
- BALANCE BETWEEN FRONTAL (EXECUTIVE CONTROL) AND LIMBIC (EMOTIONAL CONTROL) CHANGES

NEUROPLASTICITY

- COGNITIVE ADVANCES DUE TO FASTER COMMUNICATION AND INCREASED INTEGRATION
- MYELINATED AXONS TRANSMIT IMPULSES UP TO 100 TIMES FASTER AND DECREASE RECOVERY TIME
- PREFRONTAL LOBE CIRCUITRY INCREASES
 - ABILITY TO DELAY GRATIFICATION
 - ABILITY OT UTILIZE EXECUTIVE FUNCTIONING

NEUROPLASTICITY

- MODULATION RATIO
 - IN ORDER TO USE THE COGNITIVE AND BEHAVIORAL STRATEGIES WANT CLIENT TO HAVE:

INHIBITION
EXCITATION

NEUROPLASTICITY

- BRAIN AT ALL AGES IS RESPONSIVE TO ENVIRONMENTAL STIMULI
- SYNAPSES CAN CHANGE IN MINUTES WHEN STIMULATED
- NEUROPLASTICITY IS MODULATED BY
 - GENETIC FORCES
 - EPIGENETIC FORCES
- THESE FACTORS INFLUENCE THE EXPRESSION OF GENES WITHOUT CHANGING THE DNA SEQUENCE

NEUROPLASTICITY

- EPIGENETIC CHANGES ARE POTENTIALLY REVERSIBLE
- BRAIN IS VERY SENSITIVE TO SOCIAL STIMULI
- SOCIAL STIMULI (PARENTING STYLE, EARLY STRESS, ETC.) CAN EPIGENETICALLY MODIFY THE EXPRESSION OF GENES THAT INFLUENCE BRAIN STRUCTURE AND FUNCTION (INCLUDING SENSITIVITY TO STRESS)

NEUROPLASTICITY

- PREVENTION BASED ON IMPROVED PARENTING STYLE REDUCED RISK OF SUBSTANCE ABUSE IN ADOLESCENTS WITH A PARTICULAR VARIANT OF A GENE THAT RECYCLES SEROTONIN BACK INTO THE NEURON
 - THIS VARIANT IS VERY SENSITIVE TO SOCIAL ADVERSITY

NEUROPLASTICITY

- **CRITICAL PERIODS**
 - BRAIN SYSTEMS REQUIRE ENVIRONMENTAL STIMULI TO DEVELOP PROPERLY
 - EACH NEURONAL SYSTEM HAS A DIFFERENT CRITICAL PERIOD IN WHICH IT IS ESPECIALLY PLASTIC AND SENSITIVE TO ENVIRONMENT
 - DURING THE CRITICAL PERIOD THERE IS RAPID AND FORMATIVE GROWTH
 - EXAMPLE-LANGUAGE IS FROM INFANCY TO BETWEEN 8 YO AND PUBERTY

NEUROPLASTICITY

- **CRITICAL PERIODS**
 - AUDITORY PROCESSING PROBLEMS LEAD TO WEAKNESSES IN ALL LANGUAGE TASKS INCLUDING VOCABULARY, COMPREHENSION, SPEECH, READING AND WRITING
 - EXAMPLE-AUTISM HAS INCREASED BY A MULTIPLE OF AT LEAST 3 OVER THE PAST 15 YEARS. IT COULD WELL BE THAT THE AUDITORY PROCESSING CRITICAL PERIOD SHUT DOWN PREMATURELY
 - INCREASED INCIDENCE OF AUTISM IN NOISY AREAS SUCH AS LIVING NEXT TO A BUSY FREEWAY OR AN AIRPORT LEAVING AN UNDIFFERENTIATED AUDITORY BRAIN MAP

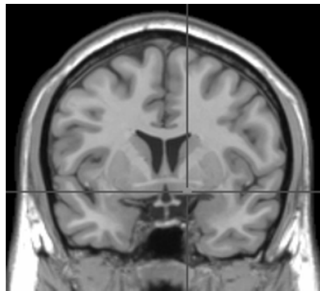
NEUROPLASTICITY

- **CRITICAL PERIODS**
 - THERE IS A DIFFERENCE BETWEEN CRITICAL PERIOD PLASTICITY AND ADULT PLASTICITY
 - CRITICAL PERIOD PLASTICITY ALLOWS FOR BRAIN MAPS TO BE CHANGED JUST BY BEING EXPOSED TO THE WORLD (ENVIRONMENT) BECAUSE THE LEARNING MACHINERY IS ALWAYS ON
 - THIS LEARNING MACHINERY INVOLVES THE NUCLEUS BASALIS (ACETYLCHOLINE)
 - ALLOWS US TO FOCUS OUR ATTENTION AND KEEP IT FOCUSED THROUGHOUT THE ENTIRE CRITICAL PERIOD ("TUNE IN")
 - ALSO HELPS US REMEMBER WHAT WE EXPERIENCE (TO FORM SHARP MEMORIES)
 - ALLOWS FOR MAP DIFFERENTIATION

NEUROPLASTICITY

- **CRITICAL PERIODS**
 - BRAIN-DERIVED NEUROTROPHIC FACTOR (BDNF) REINFORCES PLASTIC CHANGES MADE IN THE BRAIN DURING CRITICAL PERIODS
 - WHEN YOU PERFORM AN ACTIVITY THAT REQUIRES SPECIFIC NEURONS TO FIRE TOGETHER, THEY RELEASE BDNF
 - BDNF CONSOLIDATES THE CONNECTION BETWEEN THE NEURONS AND HELPS TO WIRE THEM TOGETHER SO THEY FIRE TOGETHER RELIABLY IN THE FUTURE

NEUROPLASTICITY-NUCLEUS BASALIS



NEUROPLASTICITY

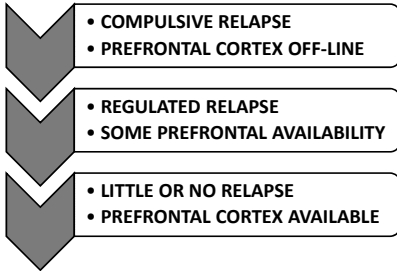
- **CRITICAL PERIODS**
 - BDNF PROMOTES THE GROWTH OF MYELIN
 - DURING CRITICAL PERIODS BDNF TURNS ON THE NUCLEUS BASALIS ALLOWING MAP DIFFERENTIATION AND CHANGE TO TAKE PLACE EFFORTLESSLY
 - WHEN STRENGTHENING OF THE KEY CONNECTIONS IS COMPLETE, BDNF HELPS CLOSE DOWN THE CRITICAL PERIOD

NEUROPLASTICITY

- **CRITICAL PERIODS**
 - AFTER THE CRITICAL PERIOD ENDS, THE NUCLEUS BASALIS CAN ONLY BE ACTIVATED WHEN SOMETHING IMPORTANT, SURPRISING, OR NOVEL OCCURS OR IF WE MAKE A CONCERTED EFFORT TO PAY CLOSE ATTENTION

PFC FUNCTIONALITY AND RELAPSE

- **RELAPSE FALLS ALONG A SPECTRUM**



PFC FUNCTIONALITY AND RELAPSE

- **RELAPSE FALLS ALONG A SPECTRUM (CONTINUED)**
 - **COMPULSIVE RELAPSE**
 - HABIT LIKE WITH LITTLE COGNITIVE INPUT
 - INVOLVES THE DORSAL STRIATUM
 - DECISION MAKING OCCURS AT LEVEL INCAPABLE OF GUIDING BEHAVIOR IN DIRECTION THAT CAN COMPETE WITH DRUG SEEKING AND USING
 - GOAL: MOVE TO RESTORE PFC CONTROL

PFC FUNCTIONALITY AND RELAPSE

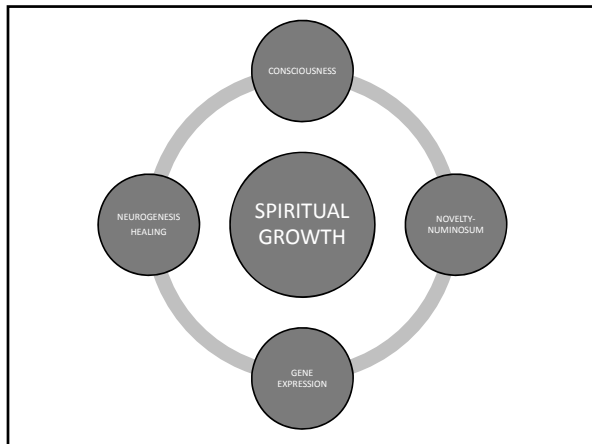
- **RELAPSE FALLS ALONG A SPECTRUM (CONTINUED)**
 - **REGULATED RELAPSE**
 - INVOLVES NAc CORE AND INPUTS FROM MEMORY, DECISION-MAKING AND EMOTIONAL STRUCTURES SUCH AS HIPPOCAMPUS, BASOLATERAL AMYGDALA, DORSAL PFC
 - HABIT-RELATED DORSAL STRIATUM NOT INVOLVED
 - SINCE PFC HAS NOT GONE OFF-LINE MIGHT BE MORE AMENABLE TO TREATMENT
 - GOAL: GREATER AND GREATER PFC CONTROL AND ABILITY TO MOVE TOWARDS LITTLE OR NO RELAPSE
 - SUBSTITUTION THERAPIES LIKE SUBOXONE, NICOTINE PATCHES, ETC MAY SERVE AS BRIDGE

PFC FUNCTIONALITY AND RELAPSE

- **RELAPSE FALLS ALONG A SPECTRUM (CONTINUED)**
 - **LITTLE OR NO RELAPSE**
 - LITTLE OR NO DYSFUNCTIONAL CHANGES IN NEURAL CIRCUITRY
 - DRUG USE PRIMARILY DEPENDENT UPON NATURAL REWARDING AND REINFORCING EFFECTS OF DRUG ON DA SYSTEM
 - PARTICULARLY THE DA PROJECTIONS INTO NAc
LALUMIERE AND KALIVAS. COCAINE ADDICTION: MECHANISMA OF ACTION. PSYCHIATRIC ANNALS. VOL 38, NO. 4, APRIL, 2008.

NEUROPLASTICITY AND PFC GROWTH

- INTENTION AND NUMINOSUM
- RIGHT HEMISPHERE TO RIGHT HEMISPHERE LEARNING
- ENRICHED ENVIRONMENT (SURROGATE)
- UNDERSTANDING SELF
- YOUNG OFFENDER REENTRY PROGRAMS
- “WRAP AROUND” SERVICES
- EDUCATION
- WELLNESS
 - PHYSICAL EXERCISE
 - NUTRITION
- MINDFULLNESS MEDITATION



CONSCIOUSNESS TO NOVELTY-NUMINOSUM

- THE NOVEL
- A HEALTHY STAFF
- LOVE AND KINDNESS
- Spiritual study and understanding of the relatedness of everything (context) leads to novelty-numinosum

NOVELTY-NUMINOSUM TO GENE EXPRESSION

- THE EXPERIENCE OF AWE, FASCINATION AND NOVELTY
- THAT WHICH IS SURPRISING, UNKNOWN AND UNPREDICTED GARNERS OUR ATTENTION AND MOTIVATES OUR LIVES LEADING TO CHANGE IN GENE EXPRESSION

**GENE EXPRESSION TO NEUROGENESIS
(EPIGENESIS)**

- PSYCHOBIOLOGY INTEGRATES EXPERIENCES OF THE MIND (AWARENESS OF NOVELTY WITH THE AROUSAL/MOTIVATIONAL ASPECTS OF THE NUMINOSUM) WITH BIOLOGY (GENE EXPRESSION AND PROTEIN SYNTHESIS TO CREATE NEUROGENESIS)

HEALING

RIGHT HEMISPHERE (RH)

- RECOGNITION AND EXPRESSION OF EMOTION
- NONVERBAL EMOTIONAL EXPRESSION
- RH TO RH AFFECTIVE COMMUNICATION EQUALS THE RELATIONAL UNCONSCIOUS
- UNCONSCIOUS RH IMPLICIT SELF CONTINUOUSLY APPRAISES LIFE EXPERIENCES AND RESPONDS ACCORDING TO ITS SCHEME OF INTERPRETATION

RIGHT HEMISPHERE (RH)

- ONE UNCONSCIOUS MIND COMMUNICATES WITH ANOTHER UNCONSCIOUS MIND
- RH RESPONDS QUICKLY TO ALL STIMULI
- IMPLICIT LEVEL OF THE THERAPEUTIC ALLIANCE (BENEATH THE EXPLICIT COGNITIONS AND LANGUAGE) ARE THE CORE OF THE CHANGE MECHANISM AT THE UNCONSCIOUS LEVEL

RIGHT HEMISPHERE (RH)

- INVOLVES CO-CREATION OF AN INTERSUBJECTIVE CONTEXT THAT FACILITATES THE PROCESS OF CHANGE (ATTACHMENT COMMUNICATION)
- ATTACHMENT COMMUNICATION REPRESENTS RH TO RH TRANSACTION THAT FACILITATE THE EXPERIENCE DEPENDENT MATURATION OF RH

RIGHT HEMISPHERE (RH)

- EMOTIONAL AVAILABILITY OF CAREGIVER IN INTIMACY SEEMS TO BE THE CENTRAL GROWTH PROMOTING FACTOR IN EARLY REARING EXPERIENCE
- CAREGIVER MAXIMIZES POSITIVE AFFECT AND MINIMIZES NEGATIVE AFFECT
- PROMOTES INCREASED TOLERANCE FOR POSITIVE AND NEGATIVE AFFECT (AFFECTIVE RANGE)

RIGHT HEMISPHERE (RH)

- THE BROADER THE RANGE OF EMOTIONS THAT A CHILD EXPERIENCES THE BROADER WILL BE THE EMOTIONAL RANGE OF THE SELF THAT DEVELOPES
- THERAPEUTIC ALLIANCE
 - THERAPIST'S FACILITATING BEHAVIORS COMBINE WITH THE PATIENTS CAPACITY FOR ATTACHMENT TO PERMIT DEVELOPMENT OF ALLIANCE (PRIMARY COMPONENT OF EMOTIONAL BOND)

RIGHT HEMISPHERE (RH)

- **THERAPEUTIC ALLIANCE (CONTINUED)**
 - KEY IS HOW TO BE SUBJECTIVELY WITH PATIENT ESPECIALLY DURING AFFECTIVELY STRESSFULL MOMENTS
 - UNCONSCIOUS INTERSUBJECTIVE PROCESSES INCLUDE EMPATHY, IDENTIFICATION WITH OTHERS AND SELF-AWARENESS
 - FACIAL EXPRESSIONS CAN BE APPRAISED BY THE RH WITHIN 30 MILLISECONDS
 - MAY TAKE HOURS TO DAYS TO GET INTENSE REACTION BACK TO BASE LINE

RIGHT HEMISPHERE (RH)

- **MUST BE ATTENTIVE TO LH PATIENT VERBALIZATIONS IN ORDER TO OBJECTIVELY DIAGNOSE AND UNDERSTAND PATIENTS DYSREGULATED SYMPTOMS**
- **BUT ALSO ATTENTIVE INTERSUBJECTIVELY TO RELATIONAL TRANSACTIONS (REFLECT EMOTIONS SUCH AS APPROVAL/DISAPPROVAL, SUPPORT, HUMOR AND FEAR)**
 - FACIAL EXPRESSIONS
 - BODY POSTURE
 - TONE AND TEMPO OF VOICE

RIGHT HEMISPHERE (RH)

- **CARL ROGERS (1986)**
"AS A THERAPIST, I FIND THAT WHEN I AM CLOSEST TO MY INNER, INSTINCTIVE SELF, WHEN I AM SOMEHOW IN TOUCH WITH THE UNKNOWN IN ME, WHEN PERHAPS I AM IN A SLIGHTLY ALTERED STATE OF CONSCIOUSNESS IN THE RELATIONSHIP, THEN WHATEVER I DO SEEMS FULL OF HEALING."

**ENRICHED ENVIRONMENT
(SURROGATE)**

- Supervisors as models and teachers
- New staff orientation
- On-going training especially in the areas of brain development and plasticity
- Staffing
- Supervisory development plans
- Spiritually based opportunities
- Attitude of respect
- Avoid "splitting"

**ENRICHED ENVIRONMENT
(SURROGATE)**

SETTING LIMITS

Too Strict

To Loose

ENRICHED ENVIRONMENT (SURROGATE)

A GOOD PARENT SETS GOOD LIMITS

FAIR

CONSISTENT

AVAILABLE

UNDERSTANDING SELF

- THERE IS A HEALING POWER INSIDE OF ALL OF US
- IT CAN BE CALLED THE SELF, SOUL, GOD IMMANENT, ATMAN, ETC.
- WHEN ONE REALIZES THIS ENERGY IT ALLOWS ONE TO BE ABLE TO SEE THE SELF INSIDE OF THOSE WHO CANNOT SEE IT INSIDE OF THEMSELVES
- THIS REDUCES THEIR PAIN

YOUNG OFFENDER REENTRY PROGRAMS

- 100,000 youths return to community from secured facilities each year
- 63% will commit another offense prior to one year
- 60-70% of youth involved in criminal activity are substance abusers
- Only 1 in 10 of these have access to substance abuse treatment

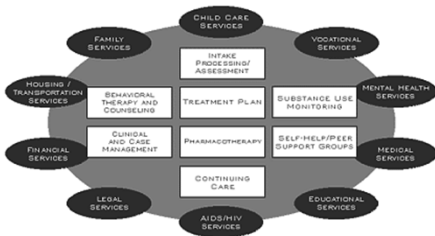
YOUNG OFFENDER REENTRY PROGRAMS

- KEY AREAS
 - ABSTINENCE
 - Percentage reporting non-use in last month increased 12%
 - EMPLOYMENT AND EDUCATION
 - Percentage reporting current employment or being in school increased 2%
 - STABLE HOUSING
 - Percentage reporting a permanent place to live rose 102% from 20% to 41%

YOUNG OFFENDER REENTRY PROGRAMS

- Rochester, NY project for 18-24 year olds
 - Recidivism rate dropped from 80% to 14%
 - Case managers begin 3-6 months prior to discharge developing a “TRANSITION PLAN”
 - Trusting Relationships
 - Pre-release activities
 - Basketball teams
 - Current events classes
 - Post-release activities
 - GED
 - Employment assistance
 - Substance abuse and mental health continuing care

“WRAP AROUND” SERVICES



NIDA www.drugabuse.gov

EDUCATIONAL PROGRAMS

- WHY GIVE A CLIENT A SIXTY MINUTE DIDACTIC SESSION?
- A DIFFERENT FORMAT
 - 15-20 minute simple didactic
 - How to participate in treatment
 - 10 minute questionnaire
 - 30 minute discussion group

EDUCATIONAL PROGRAMS

I THINK.....

I FEEL.....

I LEARNED.....

MY FUTURE BEHAVIOR WILL CHANGE...

