The Effects of Simultaneous Technique of Exercise and Psychotherapy (STEP) on Depressive Symptoms

Presented by

Dr. Son D. Nguyen
DrPH, PhD, MA, MS, MPH

Prepared for

2011 Annual Tribal Leaders' Consultation Conference
Chukchansi

March 16, 2011

Outline

1. Nature of Depression
2. Review of psychological theoretical framework and empirical evidence of psychotherapy and depression
3. Review of physiological theoretical framework and empirical evidence of exercise and depression
4. Innovative approach of depression treatment via paradigm integration of exercise and psychotherapy- an integration of practice-based evidence and evidence-based practice.
5. Walk and Talk Recommended Protocols

Introduction

- Epidemiological studies indicate that the current increased rate of depression is becoming a pandemic crisis (Robins et al., 1984)
- Two sociocultural hypotheses
  1. Aging population
     - Cohort born in middle 3rd of 20th century = 10X more likely to suffer from depression than first 3rd cohort (Klerman et al., 1985 & Seligman, 1990)
  2. Information Age
     - Less physical activity/exertion → effect neurobiological systems (Eaton et al., 1988)

Introduction

World Health Organization (WHO, 2005 & Parker et al., 2001)

- Depression/anxiety disorders lead the list of mental illness
- Approx **25%** of all visits to health care centers around the world
- About **121 million** people suffer from depression

United States (Kessler et al., 2003)

- Depression is one of the most prevalent forms of mental illness
- Costing $43 billion/yr
- Lifetime rates
  - Men = **10%**
  - Women = **22%**

Introduction *(continued)*

- DSM-IV$_{TR}$ criteria for depressive disorder
  - The majority of symptoms linked to Nucleus Accumbens situated b/w brain's motor system (striatum) and emotional circuit (limbic system)
  - Depressed mood or loss of interest or pleasure in most or all usual activities plus at least 4 of the following symptoms for at least 2 weeks
    - Changes in appetite or weight
    - Disturbed sleep
    - Motor agitation or retardation
    - Fatigue or loss of energy
    - Feelings of worthlessness, guilt
    - Suicidal ideation or attempts
    - Difficulty thinking or concentrating

American Psychiatric Association. Diagnostic Criteria from DSM-IV$_{TR}$, 2000

Introduction *(continued)*

- Depressive symptoms in SA
  - Sadness may be present but often masked by other symptoms, or may be completely absent
  - Depressed SA may be negative and irritable
  - Cognitive impairment
  - Focus on physical complaints
    - Weight loss/gain
    - Headaches
    - GI complaints
    - Fatigue
    - Pain
    - Multiple vague complaints

(Fried, 2001)

Introduction *(continued)*

- Co-morbidities of depression
  - Coronary heart disease
  - Cancer
  - Stroke
  - Parkinson’s
  - Alzheimer’s
  - Arthritis
  - Diabetes

(Ranga et al. 2002)

Introduction *(continued)*

- If not diagnosed or treated, depression can cause
  - Severe functional impairment
  - Severe physical impairment
  - Diminished quality of life
  - Increased risk of dementia
  - An increase in morbidity and mortality

(Rovner et al., 1991)

Psychological Theoretical Framework

1. Erikson's Psychosocial Development
2. Seligman's Theory of Learned Helplessness

Erikson's Last Four Developmental Stages

Period	Developmental Crisis	Positive Resolution	Negative Outcome
Adolescence 10-20 yrs	Identity vs. Role Confusion	Confidence, inner sameness & continuity, meaning for others	The inability to settle on a school or occupational identity is disturbing
Early Adulthood 20s, 30s	Intimacy vs. Isolation	Healthy friendship and intimate relationship	Isolation & self absorption
Middle Adulthood 40s, 50s	Generativity vs. Stagnation	Helping the younger generation	Social withdrawal
Late Adulthood 60 yrs +	Integrity vs. Despair	Reflecting on the past piecing together a positive review of life	Loss of self sufficiency, and of loved partners and friends

Theory of Learned Helplessness
(Seligman, 1992)

- How we attribute the events that occur in our lives has a significant effect on our attitudes and efforts in improving our lives. In particular there are three types of belief affect us:

- *Stable or unstable cause*: If we believe that events are caused by factors which do not change, we assume that it is not worth us trying to change them. So if I believe my success is based on an unchangeable ability, it will seem that it is not worth my trying to improve myself.

- *Internal or External cause*: We can believe that events are caused by ourselves or something outside of ourselves. If I assume a serious car crash was my fault, I will be less likely to drive again than if I attribute it to a greasy road.

- *Global or Specific cause*: If we believe that events are caused by a large number of factors then we feel we can do less to change things than if we see few and specific causes.

  Internal ("it's my fault"), stable ("things can't change"), and global ("this affects everything"). (Abramson, Seligman, & Teasdale, 1978)

Learned Helplessness

Symptoms of depression	Corresponding symptoms in learned helplessness
- depressed mood	- helplessness
- lack of interest in, and pleasure from, almost all activities	- cognitive representation of uncontrollability
- decreased appetite leading to weight loss	- helpless people eat less & loose wt
- insomnia or hypersomnia	- increased anxiety
- psychomotor agitation or retardation	- helpless people are passive in face of shock
- feeling without energy	- lack of response initiation
- feelings of worthlessness and guilt	- perception that individual cannot control their environment
- inability to think clearly or concentrate effectively, indecisiveness	- cognitive representation of uncontrollability
- thoughts of death, suicidal thoughts	- helplessness

Common Theme – 3 L's

- Life fragmentation/disconnectedness

- Learned helplessness cognitive schema

- Loss of purpose and meaning of life

Psychotherapy & Depression

- Validation Therapy
  - Communication technique developed by Naomi Feil in the 1960's
  - Based on this concept, pts develop emotional disturbance leading to depressive symptoms due to shame and guilt of substance abuse.
  - Derived from Rogerian psychology, emphasizing humanistic approach by acknowledging and supporting pts' feelings
  - Techniques include validating, directing, and redirecting
  - Asking who, when, where, what, and how **but not why**
  - Focuses on patients' emotional and subjective reality
  - Increased confidence, self esteem, and positive affect and cognition

(Feil, 1993)

Psychotherapy & Depression *(continued)*

- Beck and colleagues (1985) showed that cognitive therapy is effective in reducing depressive symptoms during short term treatment
- Brief form of interpersonal psychotherapy is effective in treating acute depressive symptoms (Cornes & Frank, 1994)
- Meta-analysis of 122 intervention studies of older adults (ages 55-76+) (Pinquant et al., 2001)
  - Conclusion: all psychotherapies significantly reduced depressive symptoms, with cognitive being the most effective
  - Individual interventions were more effective than group

Physiological Theoretical Framework

- Depressive symptoms is associated with HPA-axis disturbance (Irwin & Miller, 2007).
- In response to exercise (Bao et al., 2007 & Inder et al., 1998).
  - Hypothalamus produces CRH, vasopressin, and ACTH precursors → activate pituitary to secrete ACTH, beta-endorphins
  - Beta-endorphins inhibit HPA-axis leading to positive mood
  - Increased CRH levels are correlated with positive affect
  - ACTH acts as a negative feedback agent
  - Increased levels of catecholamines, epinephrine, and norepinephrine
- The HPA-axis is disturbed during depression and can be modulated by exercise (Koseoglu et al., 2003).

Exercise & Depression

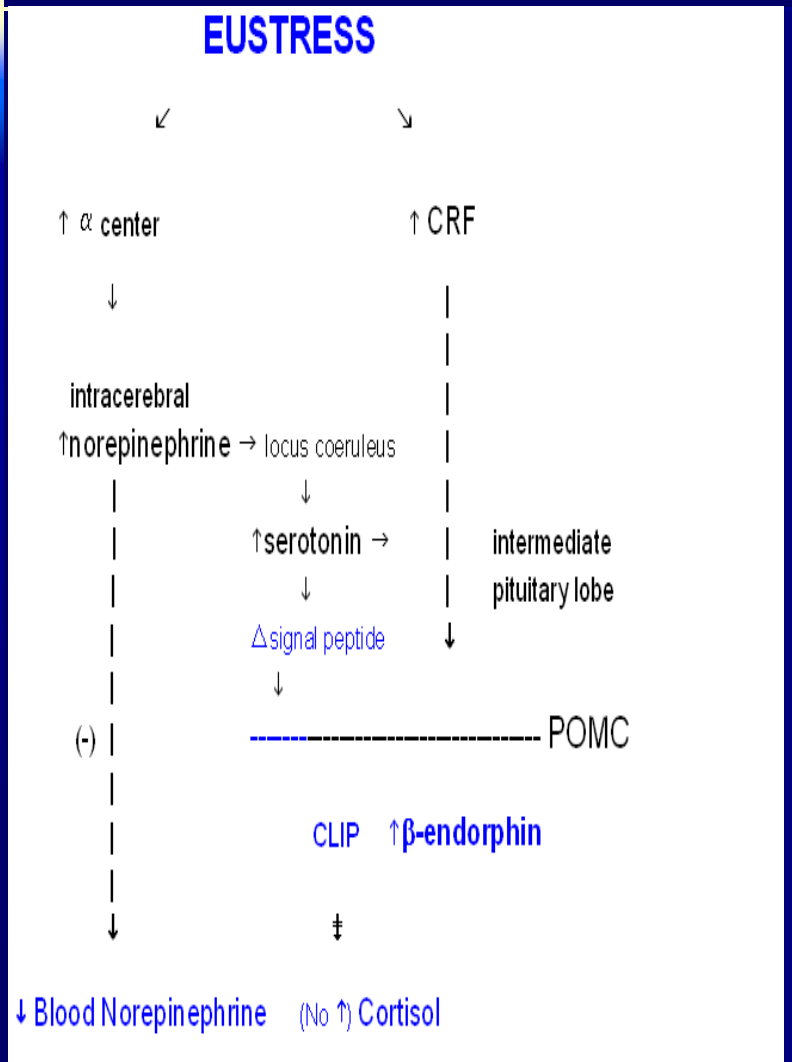
- Exercise shown to improve mood (n=28, ages 60-75)
  - After 4 weeks (3x/week of walking)
  - Emotional state, including depression, significantly improved in experimental group compared to control (Shin, 1999).
- Exercise reduces depressive symptoms (n=86; ages 53-91)
  - 10 weeks of light exercise performed to music
  - 2x/week, but 59% attendance = 8 sessions
  - 55% achieve $\geq$ 30% reduction in depressive symptoms compared to 33% of control, as measured by Hamilton Rating Scale for Depression (Mather et al., 2002)

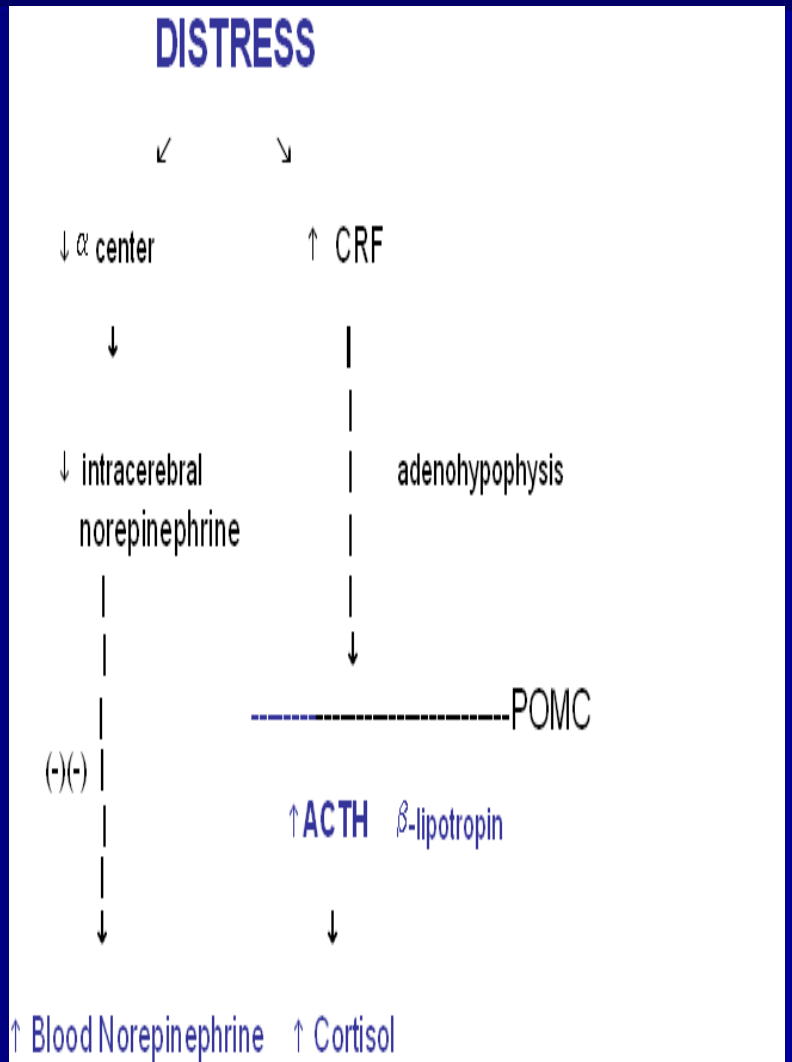
Exercise & Depression *(continued)*

- A review by Dunn and colleagues (2001) indicated that light and moderate physical activity can reduce symptoms of depression

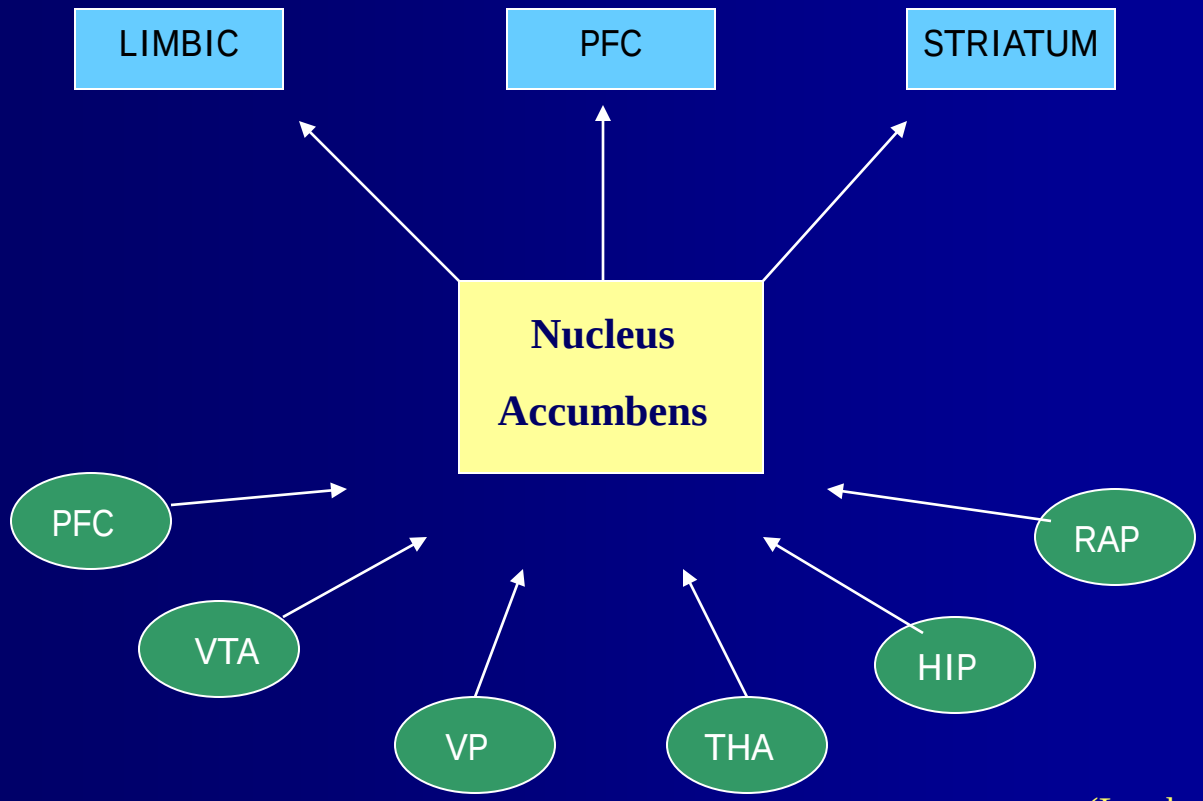
- Blumenthal and colleagues (1999) showed that after treadmill at 70% for 3x per week for 16 weeks (n=56, age $\geq$ 50), BDI and HAM-D scores were statistically and clinically reduced, especially during the first 4 weeks.

Psychophysiologic Mechanism 1
HPA-Axis (Tan & Berk, 1989)





Psychophysiologic Mechanism 2
Accumbens-Striatal-Cortical Circuit



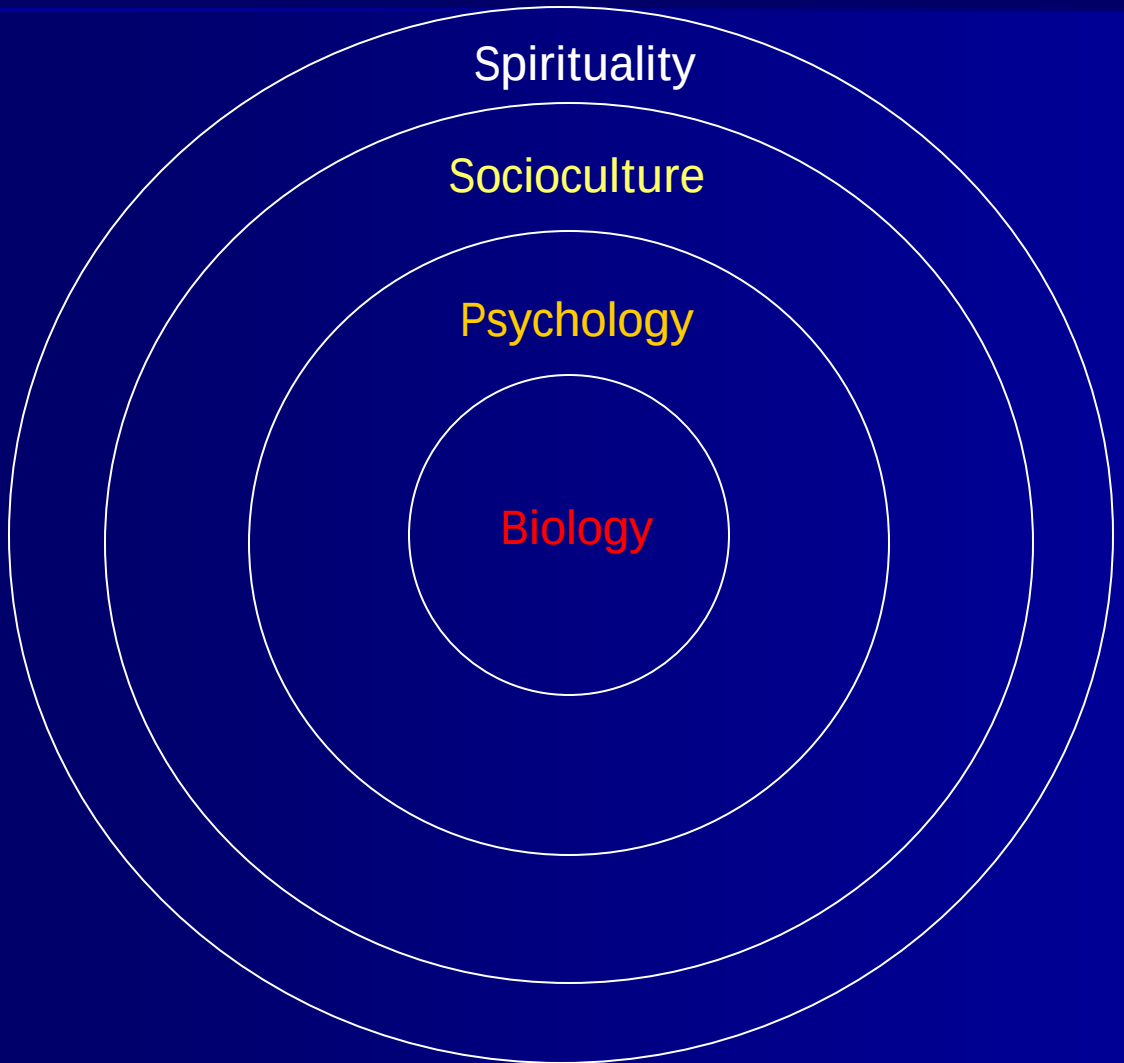
(Lambert, 2006)

ASC- Circuit & Effort-based Reward

- Limbic (Emotion- depression)
  - Emotion, learning
- PFC (Cognition- perception)
  - Attention, arousal, problem solving
- Striatum (Behavior – physical activity)
  - Movement

Directed physical effort yielding desired consequences resulting in less depressive symptoms via perception of more control and more meaning associated with efforts

Paradigm Integration
Biopsychosociospiritual Model



Exercise (Walk) Protocol

Week	Time (minutes)	Days per week
1	20	3
2	20	3
3 & 4	25	3
5 & 6	30	4
7 & 8	35	4
9 & 10	40	5
11 & 12	40	5

Time does not include warm-up or cool down. Total walking will gradually increase from 1 hour to about 4 hours a week.

Therapy (Talk) Protocol-21A's

1. Assessment–before and after
2. Acknowledgement– Noticing pt's incrementally positive changes or any difference and communicate that to pts
3. Attention – pt's attentive to the issue
4. Avoidance – pt's avoiding the issues
5. Affirmation- Validate pt's feelings and thinking
6. Assurance –provide assurance to safety in regards to physical and information
7. Awareness- pt's internal awareness of his/her cognition, emotion, and behavior
8. Atmosphere – therapeutic surrounding
9. Appreciation– recognize and appreciate the courage and effort to do the activity
10. Accommodation– pts' and therapist's flexibility
11. Alliance – therapeutic alliance to secure trust

Therapy (Talk) Protocol

1. Accentuate – emphasize and highlight the significance of walk and talk by explaining to pt to understand the process- walking together side by side, seeing in one direction, non-authoritative, etc…
2. Acceptance- the person
3. Ability – help pts to recognize their strengths
4. Association– free association
5. Anger – triggers and coping skills
6. Analogy – use analogies and examples
7. Allocation- energy allocation – extravert/introvert
8. Adaptation – ability to adapt to new environment
9. Authority- rxn
10. Actualization –self actualization stage

Model Comparison: 3T's

Current Model	STEP Model
Therapeutic Milieu	
- Closed	- Opened
- Isolated	- Stimuli
Therapeutic Alliance	
- Questioning	- Understanding
- Authority	- Trusting
Techniques	
- Static	-Dynamic
- Initiation	-Spontaneity
- Anxiety provoking	-Less anxious
- Opposing direction	-Same direction

STEP Effects

1. Authority in Current Therapy Model
   - Less authoritative
   - Paranoia
   - Trust
   - Side by side
2. Automatically elicit verbal response
   - Walk and talk
3. Spontaneity
   - Decrease anxiety
4. Increase self-awareness
5. Therapeutic alliance of understanding
6. Forward thinking/feeling/moving

Glossary

1. Nucleus Accumbens (NA)- a collection of neurons within the striatum. It is thought to play an important role in reward, pleasure, laughter, addiction, aggression, fear, and the placebo effect.
2. Prefrontal Cortex (PFC)- Cognition, perception, attention, arousal, problem solving, decision making. Executive function relates to abilities to differentiate among conflicting thoughts, determine good and bad, better and best, same and different, future consequences of current activities, working toward a defined goal, prediction of outcomes, expectation based on actions, and social "control" (the ability to suppress urges that, if not suppressed, could lead to socially-unacceptable outcomes).
3. Ventral Tegmental Area (VTA) – The origin of the dopaminergic cell bodies of the mesocorticolimbic dopamine system and is widely implicated in the drug and natural reward circuitry of the brain. It is important in cognition, motivation, drug addiction, and several psychiatric disorders.

Glossary

1. Ventral Pallidum (VP)- A component of the limbic loop of the basal ganglia, a pathway involved in the regulation of motivation, behavior, and emotions. It is involved in drug addiction.
2. Thalamus (THA)-relaying sensation, spatial sense and motor signals to the cerebral cortex, along with the regulation of consciousness, sleep and alertness.
3. Hippocampus (HIP)- plays important roles in the consolidation of information from short-term memory to long-term memory and spatial navigation. In Alzheimer's disease, the hippocampus is one of the first regions of the brain to suffer damage; memory problems and disorientation appear among the first symptoms.
4. Raphe Nucleus (RAP)- main function is to release serotonin to the rest of the brain. Selective serotonin reuptake inhibitor (SSRI) antidepressants are believed to act in these nuclei. Regulate the release of enkephalins, which inhibit pain sensation. RAP contributes in circadian rhythms -altering serotonin levels for sleep/wake states

Native American Proverb

"To understand a person,
you have to walk a mile in his/her moccasins"

Thank you!