Medical Research on the Effects of Massage

The Touch Research Institute at the University of Miami has conducted over 90 studies on the positive effects of massage therapy on many functions and medical conditions in varied age groups. Among the significant research findings are enhanced growth (e.g. in preterm infants), diminished pain (e.g. fibromyalgia), decreased autoimmune problems (e.g., increased pulmonary function in asthma and decreased glucose levels in diabetes), enhanced immune function (e.g., increased natural killer cells in HIV and cancer), and enhanced alertness and performance (e.g., EEG pattern of alertness and better performance on math computations). Many of these effects appear to be mediated by decreased stress hormones. Several of these findings have been reviewed in the TRI newsletter (Touchpoints) and in the volumes Touch Therapy (Harcourt Brace) and Touch (MIT Press).

References are cited below the subject/topic. Articles can be obtained by taking the reference to your local university library (not a public library) and asking the librarian to help you find a journal article. References listed as "in press", "in review" or "ongoing" are not yet available.

**Anorexia:** Massage therapy reduced anxiety, depressed mood and salivary cortisol (stress hormone) levels and resulted in decreased body dissatisfaction associated with anorexia.


**Back Pain:** Massage lessened lower back pain, depression and anxiety, and improved sleep. The massage therapy group also showed improved range of motion and their serotonin and dopamine levels were higher.


**Behavior Problem Children:** Preschool children with behavior problems who received massage are showed more on-task behavior, less solitary play, and less aggression.

**Breast Cancer:** Massage therapy reduced anxiety and depression and improved immune function including increased natural killer cell number.


**Bulimia:** Bulimic adolescent girls received massage therapy 2 times a week for 5 weeks. Effects included an improved body image, decreased depression and anxiety symptoms, decreased cortisol levels and increased dopamine and serotonin levels.


**Burn in Adults:** Massage therapy sessions given prior to debridement (skin brushing) decreased depression and anger, and the subjects appeared less anxious during behavior observations and reported less pain. Lower pulse and cortisol suggested lower stress levels.


**Burn in Children:** Massage therapy given prior to dressing young children's (mean age = 2.5 years old) severe body burns decreased distress behaviors. Nurses also reported greater ease in completing the dressing change procedure for the children in the massage group. The massage was conducted to body parts that were not affected.


**Cerebral Palsy:** Massage therapy helped children with CP reduce spasticity, gain more muscle flexibility, and motor function and have more positive social interaction.


**Chronic Fatigue Syndrome:** Immediately following massage therapy depressed mood, anxiety and stress hormone (cortisol) levels were reduced. Following 10 days of massage therapy, fatigue related symptoms, particularly anxiety and somatic symptoms, were reduced, as were depression, difficulty sleeping and pain. Stress hormone (cortisol) also decreased and dopamine increased.

**Cystic Fibrosis:** Children receiving daily bedtime massages from their parents reported being less anxious, and their mood and peak air flow readings improved.


**Dancers:** Massage therapy improved range of motion, mood, and performance (including balance and posture) and decreased stress hormone (cortisol) after one month of twice weekly massage therapy.


**Depressed Mothers' EEG Patterns are Changed by Massage and Music Therapy:** Brief sessions of massage therapy and music therapy were noted to shift the EEG of depressed mothers from greater relative right frontal activation (a pattern associated with depression) to symmetry.


**Depressed Pregnant Mothers:** This study is assessing the effects of massage therapy on depressed pregnant women expecting to find decreased depression, stress hormones, and obstetric complications including lower prematurity rates.


**Depressed Teenage Mothers:** Teenage mothers who received massage therapy versus those who received relaxation therapy were less depressed and less anxious both by their own report and based on behavior observations. In addition, their urinary cortisol levels were lower and their serotonin levels were higher, indicating they were less stressed and less depressed.


**Dermatitis in Children:** Children's affect and activity levels improved as did all measures of skin condition including less redness, lichenification, excoriation, and pruritis after massage therapy. Parents' anxiety levels also decreased.


**Diabetes:** Following one month of parents massaging their children with diabetes, the children's glucose levels decreased to the normal range and their increased dietary compliance increased. Also the parents' and children's anxiety and depression levels decreased.

**Down Syndrome**: Infants with Down syndrome improved in muscle tone and in performance on motor tasks following massage therapy.


**Father-Infant Massage**: Fathers gave their infants daily massages 15 minutes prior to bedtime for one month. The fathers in the massage group showed more optimal interaction behavior with their infants.


**Fibromyalgia Syndrome**: Massage therapy (as compared to transcutaneous electrical stimulation) improved sleep patterns and decreased pain, fatigue, anxiety, depression and cortisol levels.


**Fibromyalgia**: Fibromyalgia patients slept better (showed lower activity levels suggesting more deep sleep), and had lower substance P levels and less pain following a month of biweekly massages.


**HIV in Adolescents**: Natural killer cells, CD4 cells and CD4/CD8 ratio increased after one month of massage therapy.


**HIV Positive Adults**: This study examined massage therapy effects on anxiety and depression levels and on immune function. The subjects received a 45-minute massage five times weekly for a 1-month period. The findings were that: 1) anxiety, stress and cortisol levels were significantly reduced; and 2) natural killer cells and natural killer cell activity increased, suggesting positive effects on the immune system.

Massage therapy is associated with enhancement of the immune system's cytotoxic capacity. *International Journal of Neuroscience* 84, 205-218.

**Hospital Job Stress**: Hospital nursing and physician staff members were provided massage therapy, relaxation therapy and music therapy. These therapies significantly reduced anxiety, depression and fatigue as well as increased vigor.


**Hypertension**: Massage therapy decreased diastolic blood pressure, anxiety and cortisol (stress hormone) levels.


**Infants of Depressed Mothers**: Infants who received massage therapy versus those who were rocked experienced 1) greater daily weight gain; 2) more organized sleep/wake behaviors; 3) less fussiness; 4) improved sociability and soothability, 5) improved interaction behaviors; and 6) lower cortisol and norepinephrine and increased serotonin levels (suggesting less depression).


Infants of intrusive mothers with depressive symptoms showed more differential responding to the facial expressions than the infants of withdrawn mothers.


**Interventions for Premature Infants**: Early touch interventions and their effects on high-risk infants are reviewed.


**Job Performance/Stress**: Massaged subjects showed 1) decreased frontal EEG alpha and beta waves and increased delta activity consistent with enhanced alertness; 2) math problems were completed in significantly less time with significantly fewer errors after the massage; and 3) anxiety, cortisol (stress hormone) and job stress levels were lower at the end of the 5 week period.

enables EEG pattern of alertness and math computations. *International Journal of Neuroscience, 86,* 197-205.

**Juvenile Rheumatoid Arthritis:** Positive effects of parents massaging their arthritic children included less pain (particularly at night) and less morning stiffness as assessed by the Parent, Child and Physician's Assessment as well as lower anxiety and cortisol levels.


**Labor Pain:** Massage therapy during labor decreased anxiety and pain. In addition, the massaged mothers had shorter labor, shorter hospital stay and less depressed mood.


**Learning by Infants:** Massaging the lower limbs for a few minutes enhanced habituation (or simple learning) by infants.


**Learning in Preschoolers:** Preschoolers who received a 15-minute massage showed better performance on the block design and greater accuracy on the animal pegs subsets of the WPPSI.


**Leukemia:** Twenty children with leukemia were provided with daily massages by their parents and were compared to a standard treatment control group. Following a month of massage therapy, depressed mood decreased in the children's parents, and the children's white blood cell and neutrophil counts increased.


**Migraine Headaches:** Massage therapy decreased the occurrence of headaches, sleep disturbances and distress symptoms and increased serotonin levels.

**Multiple Sclerosis:** Massage therapy decreased anxiety and depressed mood, and improved self-esteem, body image and social functioning.


**Parkinson's Disease:** Adults with Parkinson's Disease were assigned to receive massage therapy or progressive muscle relaxation twice a week for five weeks. The massaged group received higher physician scores on daily living activities and the participants rated themselves as improved in daily functioning, having more effective and less disturbed sleep.


**Post burn:** Ten massage therapy sessions led to lower anxiety, anger, depression, pain and itching in adults with scars from burns.


**Post Traumatic Stress Disorder:** Massage therapy decreased the anxiety, depression and stress hormone levels (cortisol) of children who survived Hurricane Andrew. In addition, their drawings became less depressed.


**Pregnancy:** This study showed decreased anxiety and stress hormones (norepinephrine) during pregnancy and fewer obstetric and postnatal complications including lower prematurity rates following pregnancy massage.


Fetal activity during midgestation was studied in response to vibratory stimulation of the mother's abdomen (at the height of the fetal head), foot massage, hand massage, or control condition. The fetuses of mothers who received a 3-minute foot massage showed greater movement than the control fetuses.

Diego, M., Dieter, J., Field, T., Lecanuet, J., Hernandez-Reif, M., Beutler, J., Largie, S., Redzepi, M., & Salman, F. (2002). Fetal activity following vibratory stimulation of
the mother's abdomen and foot and hand massage. Developmental Psychobiology, 41, 396-406.

**Premenstrual Symptoms**: Mood improved and anxiety, pain and water retention symptoms decreased after massage therapy.


**Preterm Infant Massage in Five Days**: Preterm infants gained more weight following as few as 5 days of massage therapy.


**Preterm Neonates' Responses to massage and Heelsticks**: Routine heelstick procedures and tactile-kinesthetic massage were performed on stabilized preterm neonates to examine the differential effects on Transcutaneous Oxygen Tension (TcPO2). TcPO2 levels during the heelstick were significantly lower than during the massage stimulation. The findings indicate that social forms of touch such as massage do not appear to have a medically compromising effect on TcPO2.


**Preterm Newborns Gain More Weight**: Preterm infants gained 47% more weight, became more socially responsive, and were discharged 6 days earlier at a hospital cost savings of $10,000 per infant (or 4.7 billion dollars if the 470,000 preemies born each year were massaged). The underlying biological mechanism for weight gain in the massaged preterm newborns may be an increase in vagal tone and, in turn, an increase in insulin (food absorption hormone).


**Preterm Newborns Sleep Better**: Preterm infants who were massaged before sleep fell asleep more quickly and slept more soundly with better sleep patterns. They showed improved weight gain as compared to infants who were not massaged before sleep.

**Preterm Newborns Have a Better Clinical Course:** Preterm Infants received tactile/kinesthetic stimulation over a 10-day period. The infants averaged 21% greater weight gain per day and spent more time awake and active during sleep/wake behavior observations.


**Preterm Infants Who Benefit the Most From Massage:** Preterm infants received three daily 15-minute massages for 10 days. The massage therapy infants gained significantly more weight per day than did the control infants. For the massage therapy group, the pattern of greater caloric intake and more days in Intermediate care before the study period along with more obstetric complications differentiated the high from the low weight gainers, suggesting that the infants who had experienced more complications before the study benefited more from the massage therapy.


**Preterm Infants Develop Better:** Preterm infants who received massage therapy as newborns showed greater weight gain and more optimal cognitive and motor development eight months later.


**Preterm Infants' Weight Influences Massage Therapy Benefits:** In a review of preterm infant massage studies, massage therapy was found to facilitate weight gain only when the intervention was started when the preterm infant weighed between 1100 and 1300 g.


**Psychiatric Patients (Child and Adolescent):** Following five 30-minute massages these children/adolescents had better sleep patterns, lower depression and anxiety and lower stress hormone levels (cortisol and norepinephrine).

**Rat Pups:** Maternally deprived rat pups showed increased growth hormone following simulated rubbing.


**Review Paper:** Massage Therapy for Infants and Children: The effects of massage therapy on infants and children with various medical conditions are reviewed. The conditions range from infants who are premature, cocaine-exposed, HIV-exposed and infants of depressed mothers. The childhood conditions include asthma, burns, cancer, dermatitis, diabetes, eating disorders (bulimia), juvenile rheumatoid arthritis, posttraumatic stress disorder, and psychiatric disorders.


Massage Therapy Effects on Infants and Children: Infant and child massage therapy studies ranging across several conditions are reviewed along with recommendations to pediatricians and parents.


Massage Therapy Effects: Infant, child and adult massage therapy studies ranging across many conditions including attention disorders, depression, addictions, pain syndrome, immune and autoimmune disorders are reviewed along with potential underlying mechanisms.


Massage Therapy: Research on massage therapy and its effects on various conditions including depression, anorexia nervosa, smoking, fibromyalgia, migraine headaches, immune disorders, and diabetes.


**Smoking:** Cravings, anxious behaviors and the number of cigarettes smoked were reduced by self-massage (rubbing ear lobes or hands whenever subjects experienced a craving).


**Spinal Cord Injuries:** Massage therapy improved functional abilities, range of motion and muscle strength in spinal cord injury patients.