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Norcross J & Goldfried M. Handbook of Psychotherapy Integration: Second Edition. 2003. New York: Oxford Univ Press.

Army Regulation 40-68, Medical Services, Clinical Quality Management (Revised). Issue Date: 22 May 2009, pgs 33 & 34. Department of the Army, Washington, DC: Author. Web link: http://www.army.mil/usapa/epubs/pdf/r40_68.pdf

Disaster Response Network 1991 http://www.apa.org/programs/drn/index.aspx

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The World of Psychology Does Not Revolve Around APA

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The continued fiascoes involving the problems at APA clearly are a concern for every psychologist and our patients. The latest issue as outlined in the Hoffman Report gives every reason for concern, anger, disappointment and frustration with an organization that is seen by so many as the voice and face of professional psychology. However, the world that is psychology does not and should not revolve around APA for the conduct of a lax "meet and greet" governing body and a rogue staff who have expropriated our discipline. Yes, there is much blame to go around and every psychologist who has kept a blind eye to the ongoing and long term shenanigans within APA must also share some blame. Over the years we have all enabled that crew to manipulate us, take our dues money for parties and payoffs and, essentially, to work against practitioner interests. Tens of millions of dues wasted on reports, nonsense publications, golden parachutes and high salaries. Yet, so many of us have continued to pay up every year for the privilege of being shamed, fooled, swindled, lied to and professionally derided. That being said, it is time to look at the good of what professional psychology and its practitioners are all about.

Practice and Practitioners Are the World of Psychology Not the APA

People enter the profession of psychology for many reasons. Many because they understand and believe that helping people through their rough times can be rewarding and a substantive contribution to society. Others become psychologists because they believe it will be a lucrative profession and respectable job. Some pursue psychology without any idea of what psychology is all about. I personally believe that the vast majority of psychologists are intellectually attracted to a profession that has great value and potential for change. Every practitioner knows the feeling that comes with saving a human being from the desire to end his or her life. Most also know the feeling when despite our best efforts, they succeed. Practitioners constantly live on the edge. Some of us have also lost our lives during our attempts to save those most vulnerable to mental illness.

We have saved marriages, kept people out of jail. We have saved the country billions in lost productivity, decreased allopathic medicine costs, and increased the quality of life for families and neighborhoods. Throughout these difficult times, we have persevered and continued to do our work. This is the world of professional psychology and we will not allow the bad, illegal, and unethical behavior of those in APA to muddy our profession or shame us for being psychologists.

In our opinion, no one should reinforce APA's behavior by paying them one more cent until such time as they have earned their five-year pin for sobriety. Practitioners are in no need of redemption. The good that we do every single day is what defines who we are and none of us should ever forget this. Our commitment to our patients defines who we are and not the picture that APA rogues paint us. Our commitment to ethical practice is our untarnished legacy. The greed of others who fake that commitment is on them.

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We must, however, ensure that we will not be fooled again by the same dynamics and manipulations of those who care more about continuing their salaries than to a commitment to real change.

The New APA Torture Policy Is A Hollywood Set

On August 7, 2015, in Toronto, the APA put a resolution before the membership asking for a vote to institute a new policy for the organization. The resolution states that APA members can no longer engage in enhanced interrogation techniques, or in any way be involved as consultants or be a participant or play any role in enhanced interrogations.

Sound good, doesn't it? Of course, by even asking for this vote indicates that APA policy has been a contributor and advocate for a policy that fostered torture even as they have denied this when the issue first appeared some ten years prior. But the real issue is whether or not this resolution is real and effectively a change within APA? We disagree that it is or can be.

A resolution, by definition, holds no force or commitment to making the necessary changes within APA. A resolution is nothing more than an expression of a consensus, yes, only an expression of an opinion. It holds no legal force or anything relating to an enforceable change in policy or practice. Thus, the resolution passed in Toronto is nothing more than mere hype for the gullible. Recall that the real problem for APA was manipulating the ethics code to allow member psychologists to participate in torture for the sole purpose of currying favor with the Bush Administration, the Department of Defense, and associated agencies. So the question is why utilize a resolution when only a change the ethics code is enforceable against members who violate its provisions? The answer, unfortunately, is that APA is again playing everyone.

This resolution is nothing more than a wink and a nod to the government and the Department of Defense that it's business as usual. No one can be accused or removed from the membership for violating a resolution. It is also a swift, stopgap measure to ensure people will pay their dues to a new and renewed APA when the notices start to go out in the next months. Moreover, and most importantly, an enforceable ethics code would also mean that the states that have incorporated APA ethics into their statutes would also expose military psychologists and psychologist contractors to a loss of their license if found guilty violating the ethics code.

I realize that many psychologists would like to think that this issue has been resolved by this fakery. Can we really afford to look the other way again? The decline of professional psychology will continue unless we all take a stand. It doesn't matter if one is an APA member or not. The public, mainly through the media, sees APA as the face of psychology. This is what we need to change and we can only do this by forcing APA to a commitment to real change.

State Associations

APA is not alone in the wholesale sabotage of professional psychology. State associations could have used their influence to correct the misguided and out-of-control APA staff and administration. Does anyone recall any state association criticizing APA or calling them out about their role in supporting torture? Does anyone recall any state association rallying their membership to call upon APA to better support practice? The question is why didn't they? The first answer is that many of the people involved in the sabotage are also players in their state associations. Also, because the majority of state associations are weak entities dependent upon APA grants and assistance, they have become beholden to APA and will simply go along with anything APA wants or does. In essence, most state psychological associations are as ineffective and useless as peasants kneeling for handouts before the king or queen.

While state associations struggle to attract and maintain memberships, they continue to look the other way while APA spends tens of millions of dollars on over-the-top staff salaries. More millions spent on publications that attract less than 100 buyers or readers just to puff up the brag sheets of academics who mostly write about things of little value to the real world. And now, millions more have been spent on a "special commission with expensive consultants" to tell us what to do about the poor ethics, leadership, squandering of resources, and duplicity. No state association has said "halt the spending and take meaningful action." Meanwhile, state associations are unable to pursue legislative changes to scope of practice. They are powerless in state legislatures. Since practitioners comprise the majority of state association memberships, practice has declined and is the victim of this vicious circle of feeding an ineffective and bloated APA bureaucracy. The millions that APA poured into the Hoffman Report, and more that will be spent on special commission and consultants, could have been better spent on state associations committed to securing RxP and challenging the fraudulent reimbursement by insurers.

The bloated salaries and golden parachutes paid to APA administrators and staff is unconscionable. If we look at the salaries paid to these bureaucrats one has to ask what are they doing to earn these sums? Clearly, they are not supervising vast numbers of personnel. If we look at performance there is a clear pattern of ineffectiveness and incompetence. Psychologists once were viewed as the premier providers of mental health services. What we now see is an inverse relationship between APA salaries and practice. As salaries have increased, practice has declined. At the state level, associations hobble along impeded by declining memberships and lack of clout. But, APA is not only to blame. The staff and officers of state associations must accept their responsibility and blame for allowing APA to go down that path and for being complicit in their decline and the sabotage of psychology.

So, again, the question is do state associations need an overhaul or are they even needed at all? If state associations do need to exist, should their membership be made up of the dozens of types of psychologists and psychological industries, or should practitioners have associations that are clearly focused on their interests and needs? Having strong state associations can be a positive thing for practitioners. We do not really believe, however, that state associations tied to APA, as they now are, will ever be an effective solution to our problems. Psychology needs independent state associations and nothing less will do. If state associations refuse to reform their relationship to APA, they will remain irrelevant until such time as they no longer exist. Any psychologist paying state association dues at this time in our history is not supporting psychology or practice.

What Real Change in APA Would Look Like

Firstly, APA needs to be forced into making substantive changes to the ethics code with straight and no triple meaning deceptive wording. This will only be accomplished, in our opinion, if psychologists let them know by voting with our checkbooks. When they see a significant reduction in dues will they only understand their survival and relevance depends on elevating our profession to where it once was. Dues are the real vote.

Secondly, APA needs to remove all those from the membership that have been involved in the cover-up and torture policy. They must also refer those involved to the relevant state Board of Psychology or for criminal investigation, where appropriate. APA must not provide any golden parachute or other payments to those in their administration that have been involved in this fiasco. Allowing these people to retire becomes just another part of the cover-up.

Thirdly, the governing bodies within APA needs to evaluated and reformed. The Board of Directors has demonstrated that it really is a worthless body as presently constituted. APA Council of Representatives needs to be reformed where it cannot be manipulated by staff

and bought off by parties and subsidies. Making these bodies smaller, more transparent, and effective should be the goal. The over-riding policy question in everything that APA does must center on a single question: ***When something is proposed, is it good for consumers, society, and psychology?***

Fourthly, staff and administrative salaries must be re-evaluated to reflect performance and competence. We can suggest former GE CEO Jack Welch's approach. When a manager is given specific performance benchmarks and goals and does not achieve substantial progress for two quarters in a row, they should be replaced with an effective manager. The bureaucracy must be downsized. There are many competent, retired psychologists who would gladly volunteer their services.

Since 2006, The National Alliance of Professional Psychology Providers (NAPPP) has relied solely on volunteers and we outsource our clerical, legal, accountant and other services. Our online services work well and are efficient. Ask any NAPPP member how quickly we respond to questions, problems and issues. We can do this because NAPPP is modeled after the founders of APA who volunteered their time and expertise because they valued psychology and were motivated to grow psychology as a profession. APA today is not the APA of its founders or its past heroes. Where are the next Nick Cummings and The Dirty Dozen in APA? Where are the committed innovators in APA? Where are the next Rogers Wright and Jack Wiggins in APA? Where are the knowledgeable and skilled tacticians? Rogers is deceased but Nick Cummings, Jack Wiggins and the tacticians are in NAPPP and the Academy of Medical Psychology (AMP). Without a complete overhaul of the APA bureaucracy whatever they do now will be of little consequence.

The same group of 200-300 APAers who consistently rotate through the various APA offices is nothing more than a game of "musical chairs." They skirt, subvert and thwart the rule that one cannot hold an office in APA for more than two successive terms. Literally, APA has become so incestuous in this regard that less than 200 psychologists have rotated internally to dominate psychology and control the vector of growth for two generations. Therefore, the same usual suspects just rotate in and out of the feeding trough. It was not too many years ago that APA presidents, officers and Board members volunteered and served without pay. The large amounts of time given to APA matters resulted in these volunteers losing a significant amount of income because of the time taken away from their independent practices. Now, APA presidents earn a "stipend" of over $60,000. Today's academics, who are officers not only have their university and college salaries and any additional money they can extract from the membership. Any reasonable person can distinguish involvement that results in no loss of income, added tenure and job related credit, and paid trip expenses and still want to be called "volunteers."

Lastly, APA needs to recommit itself to policies geared to practitioners and practice. Yes, we need psychology professors but the present emphasis on academia is misplaced. The American Psychological Society is a better home for researchers and academics who should support APS and save them separate APA dues. APA keeps academics in the fold by providing dues discounts for dual APA/APS membership when practitioners are not give such discounts. Instead, practitioners are asked to volunteer a separate fee assessment that not so long ago was "mandatory."

APA needs to refocus on elevating practice and practitioners. Funding is needed to challenge the discriminatory reimbursement and utilization bars to treatment. APA can do this by funding aggressive legal challenges such as baring practitioners from hospital and medical staff membership and admitting and attending privileges in states where the laws, rules, and even the state hospital association model bylaws indicate psychologists are qualified

for these privileges. We do not need more reports. Supporting RxP campaigns in state legislatures is a must. Psychologists cannot become primary care providers of mental health until we achieve prescriptive authority. The RxP issue is not about prescribing but about the control of treatment options and being a full service provider. Such restrictions block patient freedom of choice of trained and effective practitioners who believe in and practice comprehensive, rather than medication only, approaches. Right now, physician assistants and nurse practitioners are replacing us. Is that what we want? Well, without RxP that is what we are getting. APA, with a $150 million plus budget doesn't put any significant funding into this effort yet claims it supports practice.

In conclusion, NAPPP was formed in 2006 because we saw the problems in APA and although NAPPP founders were all APA members, we came to the conclusion that nothing was likely to change. In fact, many of the same people involved in the torture issue and cover-up disregarded and sabotaged the policies that we wanted addressed before we left. It was no accident that the founding board of NAPPP contained three former APA presidents and some of APA's innovators and most earnest supporters of practice. Nevertheless, we are sure that if APA makes the changes that have been outlined in this article, psychology will again regain prominence and relevance. Practitioners hold the future of psychology in their hands. Withhold the dues and see psychology and APA thrive. Feed the dog that bites you and the only outcome is another bite. Support NAPPP and AMP as we are the groups that have been advocating for practice and an ethical psychology. APA needs to receive the wake-up call. Only then will they respond.

AGE and RAGE: Hazardous to the Mind?
A Plea for Translational Work

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Abstract
The present discussion of AGE and RAGE takes into account two meanings of interest. First, in common discourse, age and rage respectively designate a span of life and an emotion. Second, AGE (Advanced Glycation End-product) and RAGE (Receptor for AGE) are the molecular acronyms of age and rage. This article explores their respective influences on health and disease while the focus is primarily on the acronyms. The impact of mental/behavioral factors and lifestyle is considered. Practical ways of AGE assessment in food selection and preparation can be shared with patients. Hypotheses about the mind's role in stimulating or quieting AGE and RAGE are advanced. The dialogue about age (as in "aging"), modulation of negative emotions (anger/rage, etc), and mind re-direction relative to them, is an integral part of psychotherapy. At present, food choices, eating behavior, and cooking practices can be incorporated into the psychotherapeutic matrix to advocate patients' self-care and advance disease prevention. Acknowledging the mind's role as a generator of health-building or noxious molecular effects necessitates systematic inquiry.

Key words: AGE (Advanced Glycation End-product), RAGE (Receptor for Advanced Glycation End-product), Maillard reaction, anti-glycation, digestive competence, psychotherapeutic matrix, the art of conscious eating.

This article disseminates knowledge about AGE and RAGE, their relationship to dietary practices, and overall health. A healing relationship, psychotherapy also covers the substance of life, food—a major source of molecular AGE (Advanced Glycation End-Product) and RAGE (Receptor for AGE) stimulation. AGE engenders oxidative stress, inflammation, and a roster of pathologies.[1,2] RAGE, for its part, has dual effects: it may either trigger acute cellular repair mechanisms, or sustain the inflammatory response contributing to chronic diseases. Through nutritional awareness and sound dietary habits people can proactively modify AGE and RAGE. From another perspective, age - the developmental process - and rage - the intense emotion-, can profoundly influence health. In the current zeitgeist—pro-mitochondria, anti-inflammatory, and anti-aging—, psychotherapy invites a translational dialogue about diet and personal physiology relative to the mind.

Everything ages, in the conventional sense. Age is an asset, when linked to greater experience, wisdom, and temperance. Not so for its acronym, molecular AGE. Enticingly sweet, AGEs gradually rend the body and compromise the mind. They are ominous molecules that "advance" (i.e., multiply) with age.[3,4] AGE is formed by the Maillard process of **non-enzymatic glycation of free amino groups of proteins, lipids and nucleic acids.**[5] Intermediate in the Maillard reaction are Amadori products, also derived from food and quite reactive. Those processes can modify lysine or arginine residues of proteins. Glucose degradation products are generated mostly upon heat sterilization.[6]

AGE changes also occur ***in vivo,*** and are **triggered internally or externally**. Internally,

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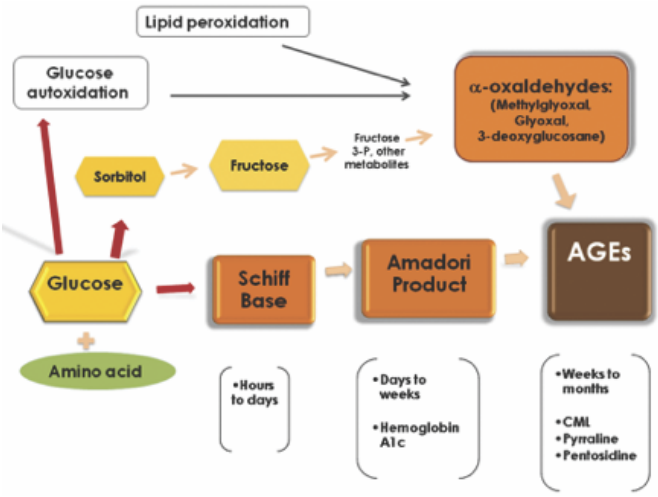
they entail hyperglycemic[7] or oxidative stress-related mechanisms.[8,9] Externally, AGEs stem from diet and food preparation. AGEs are yellow-brown, frequently fluorescent and insoluble adducts that accumulate on long-lived proteins and alter their functions. AGEs deposit themselves in human cartilage,[10] skin collagen,[11] lens cristallins, and pericardial fluid.[12] **AGE accumulation in tissues correlates with physical aging and age-dependent** neurodegenerative changes (e.g. , dementias),[13,14] metabolic syndrome, diabetes,[15] cataracts,[16] cardiovascular conditions,[17,18] and respiratory illnesses.[19] Can **the stress of life "age" you**? Indeed, as evidenced by chronic cortisol elevation, pro-inflammatory cytokines,[20,21] free radical generation, and mitochondrial function changes.[22] People who experience prolonged stress, worry, and anxiety can age unfavorably.

To follow is an AGE diagram:

Fig 1. AGE Formation [3]



RAGE is a recent member of the immunoglobulin (Ig) super-family. This cell surface receptor is a **transmembrane protein** expressed in various human cells, and readily measurable in the lung. **RAGE quickly rises at inflammation sites on inflammatory and epithelial cells.** RAGE binds extracellular ligands and **mediates stress responses** by activating signal transduction pathways **implicated in acute and chronic inflammation**. RAGE casts light on disordered cell biology and associated chronic conditions, including cancer.[23] **RAGE transports beta-amyloid proteins** across the blood-brain barrier (BBB) and is implicated in Alzheimer's disease.[24,25,26] **RAGE is also relevant to psychiatric disorders.** Chronic stress promotes illnesses through RAGE expression and signaling, focusing the host's inflammatory and repair reactions.[27] The study of RAGE in acute responses to stress and in chronic disease must discern repair-stimulating mechanisms from those that sustain inflammation and tissue damage. When upregulated in the presence of high oxidative stress, inflammation, or hyperglycemia, RAGE ligand families may shift from rapid repair to driving chronic conditions.[20]

Individuals with major psychiatric disorders show a **reduced** peripheral level of **endogenous secretory RAGE** (**esRAGE**)—anti-inflammatory—and an **elevated pro-inflammatory ligand of secretory RAGE** (**S100A9**) in conditions such as autism,[28] schizophrenia, major depression, and anxiety.[29] This suggests a **dysfunction of the AGEs/RAGE axis** that may play a part in the pathophysiology of those disorders [30]. For instance, seriously depressed patients had lower serum esRAGE and more severe carotid atherosclerosis. Their Hamilton Rating Scale for Depression (HAMD) score correlated with

intima-media thickness (IMT)[31], pointing to depression's link to atherosclerosis and cardiovascular disorders risk. In type 2 diabetes, esRAGE—non-inflammatory—may inhibit AGE–RAGE system-mediated inflammation, immune response, endothelial function disorder, and oxidative stress activation.32

Identifying the **threshold beyond which RAGE ligands mediate repair versus promoting injury** is considered key to treatment. RAGE-related processes are involved in AGE production. But AGEs also arise independently of RAGE, from damage to protein structure and extracellular matrix metabolism. On the psychological front, "rage"—ie. extreme anger—impacts several body systems, having neuroendocrine, immune, and cardiovascular effects. Experientially, that level of anger has two opposite effects or rather, it follows two different paths. One outcome is the intense anger ending in relief, "getting things off one's chest," and leaving the air clear for discussion and resolution. The second type of anger coexists with frustrations and no outlets—an impasse. It festers and decomposes into something worse. Does the latter path also trigger inflammatory RAGE?

AGE-RAGE interactions awaken two pathways (MAPKs and PI3-K*) that **activate nuclear factor kappa B (NF—kB)**. In the nucleus, NF-kB activates the transcription of genes for cytokines, growth factors and adhesive molecules. Some include: tumor necrosis factor α (TNFα), interleukin 6 (IL6), and vascular cell adhesion molecule 1 (VCAM1). **NF-kB activation enhances RAGE expression**, stimulating **inflammation promoters**. Moreover, AGE-RAGE interaction **activates NAD(P)H oxidase** (enzyme complex producing superoxide), whose upregulation increases intracellular **oxidative stress and activates NF-kB**.

Epigenetic factors, including psychosocial ones and nutrigenomics,[33] may neutralize AGE effects. Likewise, benefits from other factors, notably—high quality well-prepared food, humor, a down-to-earth and constructive outlook, a positive social network, and voluntary physical activity—coalesce with psychotherapeutic interventions to promote wellness. Classic anti- "ageing" premises across cultures are: love and work (Freud), exercise (Ancient Rome), using food as medicine (Hippocrates), taking time to reflect and de-stress. Age-old Eastern practices such as meditation, yoga, tai chi, and martial arts are now immensely popular in the Western world. Furthermore, trusted relationships, a satisfying occupation, staying active, and being self-aware are potent health-makers. How do the above practices affect AGE and RAGE?

The psychotherapeutic matrix sets the stage for tempering AGE and modulating RAGE, both meanings. Psychotherapy modifies consciousness in enduring ways, reflecting plasticity in the interrelated systems of the frontal, cingulate, and limbic cortices.[34] Mental changes have behavioral and health-related counterparts. First, **therapeutic communication** promotes empowerment and mastery, helping to tip the scales from helplessness and despondence in favor of self-regulation, improved self-esteem, and creative expression. In addition to remembering the past, one can envision a better future while being grounded in the present. Psychotherapy covers a broad range of approaches, triggering neurophysiologic changes.[35,36,37,38] The emphasis may be analytic, cognitive, experiential, behavioral, or interpersonal. In adept hands, most psychotherapies work as an emergent Gestalt between patient and therapist—a transformative relationship.[39,40,41] Second, **mind-body methods** employ relaxation, meditation, proper breathing, movement, and reflection, which promote autonomic nervous system normalization and inflammation reduction.[41,42] Third, **health and behavior interventions** improve treatment compliance, lifestyle, and eating practices.[43]

* Mitogen-activated protein kinases and phosphatydil inositol 3- kinase

The **food connection to AGE and RAGE** increased since the mid-twentieth century, which

witnessed soil nutrient depletion, pesticide explosion, and hence, an **erosion of the nutritional value in food**. Extensively processed food and consuming "junk"—nurturance ersatz?—came at a high price, with rising rates of obesity and autoimmune disorders. Those conditions involve significant inflammation, which correlates with vulnerability to emotional disorders.[44] To offset this scenario, sustainable farming and the booming health food industry emphasize nutritious ingredients.

Food preparation through **high-temperature** processing and **deep-frying**, common in today's Western diet, induces **diet-derived AGE (dAGE).** In contrast, the Mediterranean diet, rich in ω -3 fatty acids, carotenoids, vitamins, folic acid and phenolic compounds offsets AGE. Moreover, eating whole vegetables and fruits more efficiently decreases the oxidative burden than taking individual supplements. Exogenous AGEs were once ignored on the assumption that they undergo negligible gastrointestinal (GI) absorption. However, **dAGEs do increase tissue AGE**, fostering oxidative stress[45] and inflammation. On the other hand, AGE restriction and breaking AGEs cross-links, constitute preventive and/or therapeutic targets for aging-associated organ damage and age-related diseases.

Digestive competence also **plays a role in AGE formation**. Modified proteins (or peptides) may be directly taken up by the cells, suggesting **intestinal barrier disruption by AGE-modified proteins and initiation of the inflammatory response**. Digestive function repair necessitates varied interventions, nutritional and/or pharmacological, and psychological methods that address mind/brain/gut interactions.[22] Thus AGE-reduction can be linked to health, life extension, and emotional wellbeing.

Highest dAGEs occur in **animal-derived foods** that are **high in fat and protein**, namely, beef and cheeses, followed by poultry, pork, fish, and eggs. Even lean red meats and poultry contain high levels of dAGE when cooked under dry heat. **Lamb** was found to be the only **low dAGE** meat. **High AGE popular meals** include: breaded chicken breast either oven or deep fried, skinless chicken roasted with BBQ sauce, stir fried beef strips, Won Ton pork, and several McDonald favorites such as the Big Mac, Double Quarter Pounder with Cheese, chicken McGrill, and French fries. In the high carbohydrate group, major contributors to dAGE are melted cheese sandwiches, macaroni with cheese, and pizza.[45] These meals are staples in many children's and adolescents' diets, with unfortunate implications for their development, health and mental/behavioral functioning.

Lowest dAGE is found in **vegetables and fruits**, presumably due to their high water content, antioxidants, and vitamins. **Food properties and choices** are important factors in AGE prevention. Alongside AGE-producing foods, mother nature offers antidotes. Certain plant-derived substances **block glycation** through various processes:

(1) anti-glycemic action;
(2) inhibition of Amadori products formation;
(3) intervention in the post-Amadori phase of the reaction;
(4) inhibition of AGE precursors (oxidation products of sugars and early Maillard Reaction Products [MRPs]); and
(5) reduction of AGEs cross-linking.

Plant-derived anti-glycation activity correlates with the phenolic contents. **Poly-phenols** constitute the most abundant **dietary antioxidants**. They are present in the following foods: fruit, vegetables, cereals, seeds, nuts, chocolate (*Theobroma cacao)*, and in beverages such as coffee (Coffea *cruda*), green tea ((*Camellia sinensis*), olive leaf (*Olea europaea*) extract,[46] red wine grape,[47] and flavonoids in herbal infusions. Polyphenols include phenolic acids (non-flavonoid) of two subtypes, benzoic acid and cinnamic acid derivatives. Benzoic acid derivatives include compounds isolated from extracts of Chinese

lacquer tree (*Toxicodendron vernicifluum*) and nut grass (*Cyperus rotundus*) among others. In the cinnamic acid subcategory is caffeic acid, found in vegetables, fruit and herbs; e.g. apple, pear, basil, oregano, coffee, yerba mate (*Ilez paraguariensis*), lemon balm (*Melissa officinalis*), and mums (*Chrysanthemum*). Ferulic acid, another cinnamic acid derivative, exists in brown rice, wheat, oats, and in certain fruits and vegetables.[48]

Non-phenolic compounds such as terpens and saponins, carotenoids, polyunsaturated fatty acids (PUFAs), polysaccharides and oligosaccharides, withanolides (steroidal alkaloids and steroidal lactones in *Withania somnifera* root), and melanoidins, also lower the non-enzymatic protein glycosylation. Resveratrol, a natural phytoestrogen in grapes, inhibited AGE-induced proliferation and collagen synthesis activity in vascular smooth muscle.[47] In one animal study, curcumin, isolated from turmeric (Curcuma longa), potently inhibited AGE formation and cross-linking of collagen.[47] Another study showed that germanium-132 given to rats prevented AGE-related cataract formation and progression.[50]

Plant-derived anti-glycative compounds hold potential for a **new generation of therapeutics.** The use of those plants also illuminates the role of an **antioxidant-rich diet in prevention**, healthy aging, and disease treatment **within the matrix of mental and emotional regulation**. Several **anti-glycative botanicals are also adaptogens** with anti-anxiety, anti-depressant, and memory-enhancing properties.[22] In a double-blind, placebo-controlled, parallel group study, Japanese researchers assessed the anti-glycation properties of a mixed herbal extract (MHE) composed of Roman chamomile (*Anthemis nobilis*), Hawthorn berry (*Crataegus oxyacantha*), dokudami (*Houttuynia cordata*), and grape leaf (*Vitis vinifera*). After eight weeks supplementation, MHE safely improved symptoms (e.g. pains, muscle stiffness, fatigue, etc) affecting the quality of life (QOL) in addition to inhibiting AGEs in pre-diabetics.[51]

Amino acids also have anti-AGE properties. **Lysine** and mixed amino acids showed anti-glycative effects in the lens.[52] **Taurine (**sulfur-containing, from cysteine) is a major component of bile found in the large intestine. The main foods containing taurine are meat and fish. Taurine decreased acrylamide production in potato chip models, pointing to its therapeutic potential.[53] **Arginine,** an immuno-modulator, inhibited AGE formation in vitro.[54,55] **Carnosine** (from beta-alanine and histidine) is densely concentrated in the brain and muscle tissues. Animal protein contains carnosine (carne = flesh) and a vegetarian diet lacks it. In addition, carnosine seems to slow down telomere shortening, which characterizes aging.[56]

Food preparation methods are also critical in relation to **AGE formation.** In order to **reduce AGE**, it is best to cook with **moist heat,** at **lower temperatures,** and for a **shorter time**. Furthermore, a **low or acidic pH inhibits AGE** through the use of fresh-squeezed lemon juice or vinegar in cooking high AGE foods. Conversely, dry-heat processed foods such as crackers, chips, and cookies have the highest AGE in the carbohydrate group. High dAGE stems from frying, broiling, grilling, and roasting, while **low dAGE correlates with boiling, poaching, stewing, and steaming.** For example, eggs scrambled in an open pan over medium-low heat contain half the dAGEs of eggs cooked over high heat. Poached or steamed chicken has less than one fourth the dAGEs of roasted or broiled chicken.[45] Microwaving does not increase dAGE content due to short cooking times (6 min or less). However, microwaved meals become suspect since they may contain adverse DNA changes due to electromagnetic effects.[57]

Animal studies showed that a **50% reduction in dAGE was linked to lowered oxidative stress,** less deterioration of insulin sensitivity and kidney function with age. Oral glycotoxins determine the effects of calorie restriction on oxidant stress, age-related diseases, and

lifespan.[13] Reduction of dAGE is crucial for patients with diabetes and renal disease since they have impaired AGE clearance.[45] This especially applies to older psychotherapy patients, young ones with diabetes, those presenting with metabolic syndrome, and whenever psychotropic medications are part of the treatment equation.

Contemporary diet trends favor high protein and fat but lower carbohydrates for several purposes, namely, weight loss and prevention or treatment of diabetes, cardiovascular disease, and autoimmune neurological conditions. One such diet, called "paleolithic," may pose problems over the long run unless loaded with fresh vegetables and fruit rich in antioxidants. Today there are also entire diets based on raw, unprocessed, unrefined food, aimed at preserving the highest nutrient density and enzymatic powers for proper digestion. In regard to AGEs, **food combinations** along with preparation methods **may be as important as nutrient composition.**

Metabolic and nutritional interventions against AGE formation and **AGE-mediated damage** are available.[58] First, intensive **glycemic control** in diabetic patients reduce microvascular complications compared to conventional treatment, due to their lower AGE levels, even after adjustment for hemoglobin A1c (HbA1c). Furthermore, **antioxidant compounds** were studied in vitro for their AGE inhibitory activities. They included 5-aminosalicylic acid (5-ASA), N-acetylcysteine (NAC), lipoic acid (ALA), lipoic acid amide, para-aminobenzoic acid (PABA), para-aminosalicylic acid, aspirin, benzoic acid, salicylic acid, inositol, and probucol. Aspirin, salicylic acid, PABA, and benzoic acid were found to have moderate AGE-inhibitory effects while inositol and probucol were strongAGE-inhibitors in vitro, but their therapeutic effectiveness remained inconclusive.[59,60] The trace minerals zinc (**Zn)** and selenium (**Se)** help as antioxidants. **Vitamins E** (especially as tocotrienol) & **C** decrease lipid peroxidation and enhance antioxidant enzymes. **Alpha-lipoic acid** (ALA) may regulate muscular glucose metabolism in a way different from insulin. It can act as an antioxidant and a pro-oxidant. As an antioxidant, it curbs oxidative stress and AGE formation, also improving insulin sensitivity in skeletal muscles and liver.

Certain **B vitamins inhibit glycation** reactions. **Pyridoxamine**, a natural form of vitamin **B6**, traps reactive carbonyl compounds, inhibiting AGEs, lipid-derived Maillard products, and advanced lipoxidation end-products (ALEs)**.** In obese rats, pyridoxamine prevented renal and vascular complications. Ongoing clinical trials with diabetics test the efficacy of pyridoxamine in curtailing the progression of proteinuria and hyperlipidemia. **Benfotiamine,** a lipophilic derivate of vitamin **B1**, shunts glycolytic intermediates to the reductive pentose pathway. In type 2 diabetic patients, benfotiamine reduced the effect of an AGE-rich diet on endothelial dysfunction.[3] Additionally, aminoguanidine (pharmaceutical name Pimagedine, a diamine oxidase and nitric oxide [NO] synthase inhibitor) was a diabetic nephropathy drug developed to reduce AGE levels via interaction with 3-deoxyglucosone. But Phase III clinical trials were discontinued due its therapeutic limitations. Several medicinal herbs and edible plants were proven comparable to aminoguanidine or fared better with regards to AGE inhibition. Moreover, comparisons between synthetic and natural compounds indicated that natural products are more promising to be developed as potent AGE inhibitors.[58]

Another approach to AGE reduction entails the **cleavage of already formed AGEs protein-protein crosslinks**.[61,62,63,64] Although AGE breakers split up AGE-protein crosslinks in vitro, their beneficial effects in trials may not necessarily or exclusively be related to this breaking effect. AGE-breakers destroyed preformed AGE crosslinks, and improved arterial compliance in a phase 2 clinical trial with elderly patients. **Widely used pharmaceuticals** also decrease AGE. For example, certain antihypertensives, such as angiotensin converting enzyme (ACE) inhibitors and angiotensin receptor blockers (ARB), reduced

AGE accumulation in severe diabetic nephropathy [65]. Novel synthetic compounds with **multi-stage anti-AGE effects** were investigated. Among these are the following pharmaceuticals: two chelating agents with antioxidant activity, D-penicillamine and deferoxamine, and a xanthine derivative with anti-inflammatory properties, Pentoxifylline (FDA approved for muscle pain in peripheral artery disease).[59]

Two diabetes drugs, metformin and pioglitazone, showed potent glycation inhibition in vitro. Guanidine compounds block dicarbonyl groups, and Metformin (diamino biguanide compound) may decrease AGE by reducing methylglyoxal levels. Metformin scavenges reactive oxygen species (ROS). In type 2 diabetes, Metformin improves endothelial function independently of its anti-hyperglycemic properties.[66] One caveat with Metformin is a drug-nutrient interaction entailing B12 depletion. Because of its role in methylation, B12 deficiency negatively impacts neurotransmitter production, nerve health, and emotional states. Concurrently with Metformin, B12 supplementation as methyl- or adenosyl-cobalamin is indicated and, possibly, digestive support. It is crucial to understand patients' medication regimens and their mental/behavioral effects at the time of a psychological evaluation.

From a psychological perspective, age and rage modulation are highly desirable. Diet and digestive competence are linked to healthy "age-ing" and longevity. Moreover, the prevailing emotional tone—hostile/angry vs friendly—significantly affects those at the dinner table. **Eating is often a social behavior**—food and company. **Nutrition and nurturance coexist** in the eating milieu. Studies of families eating together *versus* those that did not, or tension *versus* friendliness showed a differential impact on the mental health and behavior of growing children.[67,68] In adulthood and old age, eating alone versus sharing a meal, or having a private, peaceful meal versus sharing food in a tense, hostile encounter, differently impact digestion and nutrient assimilation. Interestingly, the word "agape," translated as "unconditional love" in Christianity or "compassion" in Buddhism, also has a relationship to food. Among Western traditions, "***Agape***" (fr. Greek, love feast) designated a special **communal meal**. Even when people brought their own food, it was foremost a shared experience. In Spanish, the word "agape" is synonymous with "banquet."

Mealtime stressors may provoke indigestion and, coupled with eating certain foods cooked under high heat, also trigger AGE. **The art of conscious eating**, originating from Yoga and Ayurvedic medicine, can counteract those effects when woven into the psycho-therapeutic process. Based on an individual's constitution and the seasons, Ayurveda recommends sensible food selection and combinations, healthfully prepared, deep breathing, chewing, tasting, self-observation, and quiet time [69]. In various religious traditions, the blessing of a meal gives the participants a chance to de-contract and welcome food. Warm and soothing interactions at the table or peaceful solitude induce a "rest and digest" state (parasympathetic), with enhanced digestion. How would improving the quality of one's eating experience affect AGE and RAGE?

So far studies of AGE and RAGE have focused on diabetes, metabolic syndrome, aging, neurodegenerative diseases, and cardiovascular conditions. Diabetes complications are relevant to mental health because they raise dementia risk in people over 50 years of age. In this group, supporting improved glucose control and AGE reduction prevented decline in mental ability or performance.[7,70] Recent work on psychiatric disorders addressed RAGE deficits as well.[28,29]

AGE is of concern among all patient populations. SAD (Standard American Diet) is today's "Western diet," high in trans-fats, sugar, refined and processed foods, which are sources of molecular AGE and RAGE—let alone effects on mental functioning. A longitudinal

Australian study linked that diet to the prevalence of attention deficit hyperactivity disorders (ADHD) in a pediatric and young adult cohort.[71] Obesity, on its part, has become a major public health problem, even in pediatric settings. Further, adults diagnosed with psychotic or bipolar disorders, and children or adolescents with severe behavior problems are often prescribed atypical antipsychotics (AAP).[72] This regimen places them at high risk for undesirable weight gain and metabolic syndrome. Among elderly patients suffering from depression and anxiety, the prevention and treatment of cognitive impairment pose multi-disciplinary challenges tied to nutritional deficiencies. Hence, the **conversation about diet, food preparation, eating habits, and digestion belongs in the psychotherapy office.**[73] Diet plans are best made together with patients, along with education about the mind/brain/gut connection affecting food assimilation and mood.[74] Collaboration with a trained clinical nutritionist and the primary care physician is recommended.

The preceding paragraphs contain assessment guidelines for AGE and investigative studies of RAGE since both relate to inflammation and disease, also being implicated in psychiatric conditions. It must be noted that certain RAGE ligands can also act as a protective factor in relation to cardiovascular health. Cell Biolabs in San Diego, CA, tests AGE-linked biomarkers for research, but they are not available for clinical purposes.[75] However, AGE levels were tabulated for various foods and food preparation methods. One can estimate an individual's AGE from his/her diet composition and cooking practices.[45] Exploring eating behavior within the psychotherapeutic matrix appears fruitful, since wholesome nutrients support positive changes in the Mind/Neuroendocrine Immune (MNEI) connections.[76] Furthermore, social-environmental factors modify gene expression, also shaping phenotypes and disease vulnerability. Thus the input from social genomics may assist with disease prevention and wellness promotion.[77]

Supporting mental health is achievable by eating a **balanced, antioxidant, anti-AGE diet**. This diet embraces unrefined foods, some in their raw state, abundant vegetables and fruit, sensible amounts of animal protein (unless vegetarian), plenty of good quality water away from meals, and individualized micronutrient supplementation.[68] Indispensable steps include:

(1) transition to unsprayed and organic, farm-fresh, sustainable food as much as possible;
(2) elimination of nutrient-poor, processed foods;
(3) relaxation before and after eating for proper digestion;
(4) regular exercise/activity to improve digestion and energy metabolism; and
(5) reduction of techno-stress

In summary, the purposeful modulation of AGE and RAGE (dual meanings) is embedded within whole health and influenced by psychosocial factors. Questions and hypotheses were presented, recommending sorely needed two-way translational work in integrative health. This means going from molecular processes to mental and interpersonal ones, and back again. Psychotherapy and lifestyle interventions are substantially enhanced with personalized nutrition. As pharmaceuticals, botanicals, and micronutrients are increasingly employed, it is also possible to moderate AGE and RAGE through mindful eating. Nutritional interventions favor the Mediterranean diet with individualized changes as an auspicious starting point for our patients.[78]

Looking ahead to future research and practice, it is worthwhile to consider oxidative reactions and inflammation in relation to chronic stress, anxiety, depression, and dietary factors. Directing and **focusing the mind toward one's own physiology in relation to engagement and involvement**[79] may give additional impetus to managing AGE and RAGE within the context of personal integration [80] and healing.

Epilogue

"*Age is an issue of mind over matter.*
If you don't mind, it doesn't matter,"

wrote Mark Twain humorously. Per this article, AGE and MIND matter, seriously.

References

1. O. Nedi O, Rattan SIS, Grune T and Trougakos IP, Molecular effects of advanced glycation end products on cell signaling pathways, ageing and pathophysiology, *Free Radical Res,* 2013, Aug, 47 (Suppl.1): 28-38
2. Jacobs K, Haucke E, Navarrete Santos A, Grune T, and Simm A, Role of advanced glycation end-products in cellular signaling, Redox Biol, 2014, 2, 411–429
3. Luevano-Contreras C and Chapman-Novakofski H, Dietary advanced glycation end products and aging*, Nutrients*, 2010, 2(12): 1247–1265.
4. Semba RD, Emily J. Nicklett EJ, and Ferrucci L, Does accumulation of advanced glycation end products contribute to the aging phenotype? *J Gerontol A Biol Sci Med Sci.,* 2010, September;65A(9):963–975
5. Pouillart, P, Mauprivez, H, Ait-Ameur L, Cayzeele A, Lecerf, JM, Tessier FJ, and Birlouez-Aragon I, Strategy for the study of the health impact of dietary Maillard products in clinical studies: The example of the ICARE clinical study on healthy adults. *Ann. N. Y. Acad. Sci.* **2008**, *1126*, 173-176.
6. O'Brien J and Morrissey PA. (1989) Nutritional and toxicological aspects of the Maillard browning reaction in foods. *Crit Rev Food Sci Nutr*., 28:211–218.
7. Kerti L, Witte AV, Winkler A, Grittner U, Rujescu D, and Floël A, Higher glucose levels associated with lower memory and reduced hippocampal microstructure**,** *Neurology* 2013, Nov, 81:1746-1752
8. Lai M, Brismar H, Ekloef AC, Aperia A, Role of oxidative stress in advanced glycation end product-induced mesangial cell activation, *Kidney Int,* 2002, Jun, 61(6):2006-14.
9. Lee BW , Chae HY, Kwon SJ, Park SY, Ihm J, and Ihm SH, RAGE ligands induce apoptotic cell death of pancreatic β-cells via oxidative stress, *Int J Mol Med*, 2010, Dec, 26(6):813-8.
10. Sanguineti R, Puddu A, Mach F, Montecucco F, and Viviani GL, Advanced glycation end products play adverse pro-inflammatory activities in osteoporosis, in Mediators of Inflammation, Vol. 2014, Hindawi Publishing Corp., 9 pages
11. Paraskevi G and Boehm M, Advanced glycation end products**:** Key players in skin aging? *Dermatoendocrinol,* 2012 Jul 1; 4(3): 259–270.
12. Marchetti P, Advanced glycation end products (AGEs) and their receptors (RAGEs) in diabetic vascular disease, *Medicographia*, 2009, 100, 31:3, 257-265
13. Weijing C, Uribarri J, Zhua L, Chena X, Swamya S, Zhaoa Z, Grosjeana F, Simonaro C, George A. Kuchel GA, Schnaider-Beerie M, Woodward M, Strikera GE, & Vlassara H, Oral glycotoxins are a modifiable cause of dementia and the metabolic syndrome in mice and humans, *PNAS*, 2014, 111:13, 4940-4945
14. Serratos IN, Castellanos P, Pastor N, Millán-Pacheco C, Rembao D, Pérez-Montfort R, Cabrera N, Reyes-Espinosa F, Díaz-Garrido P, López-Macay A, Martínez-Flores K, López-Reyes A, Sánchez-García A, Cuevas E, and Santamaria A, Modeling the interaction between quinolinate and the receptor for advanced glycation end products (RAGE): Relevance for early neuropathological processes, PLOS/One, DO1: 10.1371/journal.pone.0120221, March 10, 1-22
15. Dandona P, Chaudhuri A, and Mohanty P, Macronutients, advanced glycation end products, and vascular reactivity, *Diabetes Care,* 2007, 30 (10): 2750-2751

16. Hashim Z and Zarina S, Advanced glycation end products in diabetic and non-diabetic human subjects suffering from cataract, 2011, *Age*, Sep; 33(3): 377-84
17. Shimizu F, Sano Y, Tominaga O, Maeda T, Abe MA, and Kanda T, Advanced glycation end-products disrupt the blood-brain barrier by stimulating the release of transforming growth factor-β by pericytes and vascular endothelial growth factor and matrix metalloproteinase-2 by endothelial cells in vitro, *Neurobiol. Aging*, 2013, 34 (7):1902-12
18. Tanaka N , Yonekura H, Yamagishi S, Fujimori H, Yamamoto Y, Yamamoto H, The receptor for advanced glycation end products is induced by the glycation products themselves and tumor necrosis factor-alpha through nuclear factor-kappa B, and by 17beta-estradiol through Sp-1 in human vascular endothelial cells, *J Biol Chem,* 2000, Aug 18; 275(33): 25781-90
19. Wu L, Ma L, Nicholson LFB, Black PH, Advanced glycation end products and its receptor (RAGE) are increased in patients with COPD, *Respiratory Med,* 2010, 105 (3): 329-336
20. Chuah YK, Basir R, Talib H, Tie TH, and Nordin N, Receptor for advanced glycation end products (RAGE) and its involvement in inflammatory diseases, *Intl J Inflamm,* 2013, Article ID 403460, 15 pages
21. Wilson CJ, Finch CE, and Cohen HJ, Cytokines and Cognition—The case for a head-to-toe inflammatory paradigm, *J Am Geriat Soc*, 2002, 50(12): 2041-2056
22. Galle SA, Minding the mitochondria: From cell to psyche, *Arch. Med Psychol*, Fall Issue (Dec) 2014, Vol. 6:10-35
23. Louis J Sparvero LJ, Denise Asafu-Adjei D, Kang R, Tang D, Amin N, Im J, Rutledge R, Lin B, Amoscato AA, Zeh HJ and Lotze MT, RAGE (Receptor for Advanced Glycation Endproducts), RAGE ligands, and their role in cancer and inflammation, *J Transl Med*, 2009, March 17, 7:17
24. Emanuele E, D'Angelo A; Tomaino C, Binetti G, Ghidoni R, Politi P, Bernardi L, Maletta R, Bruni AC, and Geroldi D, Circulating levels of soluble receptor for advanced glycation end products in Alzheimer's disease and vascular dementia, *Arch Neurol.*, 2005, 62 (11): 1734-1736
25. Shimizu F, Sano Y, Tominaga O, Maeda T, Abe MA, Kanda T., Advanced glycation end-products disrupt the blood-brain barrier by stimulating the release of transforming growth factor-β by pericytes and vascular endothelial growth factor and matrix metalloproteinase-2 by endothelial cells in vitro, *Neurobiol Aging.* 2013 Jul;34(7):1902-12
26. Perrone L, Grant WB, Observational & ecological studies of dietary advanced glycation end-products in national diets and Alzheimer's disease incidence and prevalence, *J Alzheimer's Dis*, Feb 2015, IOI: 10.32331JAD-140720]
27. Herold K , Moser B, Chen Y, Zeng S, Yan SF, Ramasamy R, Emond J, Clynes R, Schmidt AM. Receptor for advanced glycation end products (RAGE) in a dash to the rescue: inflammatory signals gone awry in the primal response to stress*, J Leukoc Biol*. 2007 Aug, 82(2): 204-12
28. Emanuele E, Minoretti P, Arra M, Politi P, Ucelli di Nemi S, and Barale F, Alterations of circulating endogenous secretory RAGE and S100A9 levels indicating dysfunction of the AGE-RAGE axis in autism, *Neuroscience Letters*, 2006, 410:169-173
29. Emanuele E, Martinelli V, Carlin MV, Fugazza T, Barale F, and Politi P, Serum levels of soluble receptor for advanced glycation endproducts **(sRAGE)** in patients with different **psychiatric disorders**, *Neuroscience Letters,* 2011, 487: 99-102
30. Boso M, Emanuele E, Minoretti P, Arra M, Politi P, Ucelli di Nemi S, and Barale F, Alterations of circulating endogenous secretory RAGE and S100A9 levels indicating dysfunction of the AGE–RAGE axis in **autism**, *Neuroscience Letters 410*, 2006, 169-173
31. Chen G, Wu Y, Wang T, Liang J, Lin W, Li L, Wen J, Lin L, Huang H, Association

between serum endogenous secretory Receptor for advanced glycation end products and risk of type 2 diabetes mellitus with combined depression in the Chinese population, *Diabetes Technol & Ther.* 2012, 14:10, 936-942
32. Katon W, Pedersen HS, Ribe AR, Fenger-Grøn M, Davydow D, Waldorff FB, Vestergaard M, Effect of depression and diabetes mellitus on the risk for Dementia, *JAMA Psychiatry*, 2015
33. Kaput, J. Diet-Disease Gene Interactions, *Nutrition,* 2004, 20: 26-31.
34. Karlsson H, How Psychotherapy changes the brain, *Psychiat Times*, Aug 11, 2011
35. Kandel ER. A new intellectual framework for psychiatry, *Am J Psychiat,* 19
36. Barsaglini A, Sartori G, Benetti S, Pettersson-Yeo W, and Mechelli A, The effects of psychotherapy on brain function: A systematic and critical review, *Progress in Neurobiol,* 2014, March, 114: 1-14
37. Linden DE, How psychotherapy changes the brain—the contribution of functional neuroimaging, *Mol Psychiat*, 2006 Jun; 11(6): 528-38
38. Liggan DY and Kay J, Some neurobiological aspects of psychotherapy*, J Psychother Pract Res*, 1999, Spring, 8 (2): 103-114
39. Benedetti F, How the doctors' words affect the patient's brain, *Evaluation and the Health Professions,* 2002, 25 (4): 369-386
40. Schwartz JM, The Mind and The Brain: Neuroplasticity and the Power of Mental Force, Harper Collins, NY, NY, 2002
41. Galle SA, "Hypnosis and Yoga in Psychotherapy, Ch. 5, 55-70. In Leskowitz E (Ed), Transpersonal Hypnosis: Gateway to Body, Mind, and Spirit, CRC Press, Boca Raton, FL, 1999
42. Galle SA, The awareness-energy connection through yoga, hypnosis, and neurofeedback, *Intl J Yoga Ther*, 2001, 11:77-83
43. Cai W, He JC, Zhu L, Chen X, Zheng F, Striker GE, Vlasara H, Cultivate Healthy Practices, *Am J Pathol,*2008; 173:327-336
44. Najjar S, Pearlman DM, Alper K, Najjar A and Devinsky O, Neuroinflammation and psychiatric illness, *J Neuroinflamm.,* 2013, 10 (43): 1-24
45. Uribarri J, Woodruff S, Goodman S, Cai W, Chen X, Pyzik R, Yong A, Striker GE, and Vlassara H, Advanced glycation end products in foods and a practical guide to their reduction in the diet, *J Am Diet Assoc*, 2010, 110 (6): 911-916
46. Kontogianni VG , Charisiadis P, Margianni E, Lamari FN, Gerothanassis IP, and Tzakos AG, Olive leaf extracts are a natural source of advanced glycation end product inhibitors, *J Med Food*. 2013 Sep;16 (9): 817-22
47. Jariyapamornkoon N, Yibchok-anun S and Adisakwattana S, Inhibition of advanced glycation end products by red grape skin extract and its antioxidant activity, *J Agric Food Chem* 2005, **53:**3167-3173
48. Odjakova M, Popova E, Al Sharif M and Mironova R, Plant-Derived Agents with Anti-Glycation Activity, Ch. 10, in "Glycosylation," Petrescu S (Ed), InTech, 2012, 223-256
49. Sajithlal GB , Chithra P, Chandrakasan G., Effect of curcumin on the advanced glycation and cross-linking of collagen in diabetic rats, *Biochem Pharmacol*. 1998, Dec 15, 56(12): 1607-14
50. Unakar NJ , Johnson M, Tsui J, Cherian M, Abraham EC., Effects of germanium-132 on galactose cataracts and glycation in rats, *Exp Eye Res*. 1995, Aug; 61 (2): 155-64
51. Yonei Y, Miyazaki R, Takahashi Y, Takahashi H, Nomoto K, Yagi M, Kawai H, Kubo M, and Matsuura N, Anti-glycation effect of mixed herbal extract in individuals with pre-diabetes mellitus: A double-blind, placebo-controlled, parallelgroup study, *Anti-Aging Med*, 2010, 7 (5): 26-35
52. Sulochana KN , Punitham R, and Ramakrishnan S, Beneficial effect of lysine and amino acids on cataractogenesis in experimental diabetes through possible anti-glycation of lens proteins. *Exp Eye Res,* 1998, Nov, 67(5): 597-601

53. Odetti O, Pesce C, Traverso N, Menini S, Pesce Maineri E, Cosso L, Valentini S, Patriarca s, Cottalasso D, Marinari UM, and Pronzato MA, Comparative trial of *N*-acetyl-cysteine, taurine, and oxerutin on skin and kidney damage in long-term experimental diabetes, *Diabetes,* 2009, 52: 499-505.
54. Serveinick DA, Bryant D, Wells-Knecht KJ, and Wiesenfeld PL, **L-arginine** inhibits in vitro nonenzymatic glycation and advanced glycosylated end product formation of human serum albumin, *Amino Acids*, 1996, 11: 69-81.
55. Yeh CL, Hu YM, Liu JJ, Chen WJ, Yeh SL, Effects of supplemental dietary arginine on the exogenous advanced glycosylation end product–induced interleukin-23/interleukin-17 immune response in rats, 2012, *Nutrition,* Oct 28 (10): 1063-67
56. Alhamdani MS, Al-Azzawie HF, Abbas FK, Decreased formation of advanced glycation end-products in peritoneal fluid by carnosine and related peptides, *Perit Dial Int,* 2007, Jan-Feb, 27(1): 86-9
57. Becker RO and Selden G, The Body Electric: Electromagnetism and the Foundation of Life, William Morrow & Co, NY, NY, 1985
58. Peng X , Ma J, Chen F, and Wang M, Naturally occurring inhibitors against the formation of advanced glycation end-products, *Food Funct*. 2011, Jun, 2 (6): 289-301.
59. Rahbar S & Figarola JL, Novel inhibitors of advanced glycation end-products, *Arch Biochem & Biophys,* 2003, 419: 63–79
60. Rahbar S, unpublished data
61. James L. Figarola JL, Shanmugam N, Natarajan R and Rahbar S, Anti-Inflammatory effects of the advanced glycation end product inhibitor LR-90 in human monocytes, 2015, *Diabetes,* June, 64(6): 1-17
62. Lehman TD, Ortwerth BJ, Inhibitors of advanced glycation end product-associated protein cross-linking, *Biochimica et Biophysica Acta*, 2001, 1535: 110-119
63. Ryoji Nagai R, Murray DB, Metz TO, and Baynes JW, Chelation: A fundamental mechanism of action of AGE inhibitors, AGE breakers, and other inhibitors of diabetes complications, *Diabetes*, 2012, 61: 549-559
64. Yuichi Kaji Y, Oshika T, Takazawa Y, Fukayama M, Fujii N, Pathological Role of D-amino acid-containing proteins and advanced glycation end-products in the development of age-related macular degeneration, *Anti-Aging Med*, 2010, 7 (10): 107-111
65. Forbes MJ, Cooper ME, Thallas V, Burns WC, Thomas MC, Brammar GC, Lee F, Grant SL, Burrell LM, Jerums G, and Osicka TM, Reduction of the accumulation of advanced glycation end products by ACE inhibition in experimental diabetic nephropathy**, 2002,** *Diabetes,* Nov., 51: 3274-3282
66. Yamagishi S , Matsui T, Nakamura K., Blockade of the advanced glycation end-products (AGEs) and their receptor (RAGE) system is a possible mechanism for sustained beneficial effects of multifactorial intervention on mortality in type 2 diabetes. *Med. Hypotheses,* 2008, 1(5), 749-75.
67. Sen, B. The relationship between frequency of family dinner and adolescent problem behaviors after adjusting for other family characteristics. *J Adol,* 2010, 33:187-196
68. Galle SA, Molecular nutrition: A missing link in pediatric pharmacotherapy?, *The Tablet,* APA Div. 55, 2010, 3: 68-73.
69. Lad V, Ayurveda: The Science of Self-Healing, Lotus Press, Twin Lakes, WI, 1990
70. Chiu WC, Ho WC, Liao DL, Lin MH, Chiu CC, Su YP, Chen PC, & Health Data Analysis in Taiwan (hDATa) Research Group, Progress of diabetic severity and risk of dementia, *J Clin Endocrinol & Metab*, July 2015
71. Howard AL, Robinson M, Smith GJ, Ambrosini GL, Piek JP, and Oddy WH, ADHD is associated with a 'Western' dietary pattern in adolescents, *J Attention Disorders*, 2010
72. Olfson M, King M, and Schoenbaum M, Treatment of young people with anti-psychotic medications in the United States, *JAMA Psychiat*, July 1, 2015, online July

01, 2015. doi:10.1001/jamapsychiatry.2015.0500
73. White BA, Horwath CC, & Conner TS, Many apples a day keep the blues away—daily experiences of negative and positive affect and food consumption in young adults, *Br J Health Psychol*, 2013, Nov;18(4): 782-98
74. Steenbergen L, Sellaro R, van Hemert S, Bosch JA, and Colzato LS, A randomized controlled trial to test the effect of multispecies probiotics on cognitive reactivity to sad mood, *Brain, Behav, & Immun*, 2015, 48: 258-264
75. Cell Biolabs, Inc, Age Competitive ELISA: AGE Assays and Reagents, 2014-2015 *OxiSelect™ Advanced Glycation End Product (AGE) Competitive ELISA* Kit (San Diego, CA)
76. Galle SA, The fire within: A perspective on pain, Academy of Medical Psychology (AMP) Newsletter, March 2015
77. Slavich GM and Cole SW, The Emerging Field of Human Social Genomics, *Clin. Psychol Sci*, 2013, 1 (3): 331-348
78. Valls-Pedret C, Sala-Vila A, Serra-Mir M, Corella D, de la Torre R, Martinez-Gonzalez MA, Martinez-Lapiscina EH, Fito M, Perez-Heras A, Salas-Salvado J, Estruch R, and Ros E, Mediterranean diet and age-related cognitive decline: A randomized clinical trial, *JAMA Intern Med* 2015, July 1, 175 (7): 1094-103
79. Singer MT, Engagement-involvement: A central phenomenon in psychophysiological research*, Psychosom Med*, 1974,Vol 36(1), Jan 1-17
80. Shore AN, The right brain implicit self: A central mechanism of the psychotherapy change process, Ch. 10, 177-202, in Knowing, Not-Knowing and Sort-of-Knowing: Psychoanalysis and the Experience of Uncertainty, Petrucelli J (Ed.) Karnac Books, London, UK, 2010

Changing Healthcare in the Era of the Patient Protection and Affordable Care Act

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The Patient Protection and Affordable Care Act (ACA): President Obama's landmark Patient Protection and Affordable Care Act (P.L. 111-148)[1] provides an exciting opportunity to make a real difference for those health systems, facilities, communities, and colleagues with vision and the willingness to demonstrate leadership. "Early adopters" is a concept in business management theory that describes those with the vision, capital, research and development, flexibility, and risk tolerance to enter into new industries, markets, or expanding markets in ways that implement the best practices and technology. In this way, an early adopter (individual or firm) is an entity that moves satisfaction of consumer needs and demand and product efficacy forward rapidly. More "maintenance management types" often resist such opportunities and wait and see how they come out, and thus act out their risk aversion and greater value of protecting assets and the status quo than change. They don't have enough of the four necessary components/inputs that drive capitalism, and especially an essential one for change (entrepreneurial skill) to motivate risk. They often lose out on capturing a significant or even survivable market share during times of innovation, technology advances, or consumer demand change. When new technology, funding streams, and flexibilizing or definition of laws and regulation change, opportunities arise. Those with the four main capitalistic inputs in abundance (capital, landed resources, labor force, and entrepreneurial skill) can leap to the next level in their organizational, product, revenue, competitive advantage, and positioning and address market consumer early adopters and approximate early adoption in their organizational philosophy and goals. We need both philosophical and organizational dynamics to balance stability and security with appropriate levels of innovation, change, and progress. Movement toward either extreme can become debilitating, as evidenced by American Politics. We are at such a place (a transition point) with the ACA implementation where change and technological advance in healthcare is possible, but will be balanced by vested interests that will err on the side of caution! To the extent that both these dynamics are allowed to operate at the optimal levels we will make reasonable advancements in healthcare quality and economics, but maintain a stable and secure system!

Combined with the enacted Mental Health Parity legislation[2] (in the 11th hour watered down and loopholes lobbied in by the Republican Senate caucus), the ACA represents the largest expansion of health insurance coverage (revenue stream and capital building potential, and ability to use entrepreneurial skill to direct the extant skilled workforce and landed holdings in the healthcare system), particularly for behavioral health, in the history of our nation. Mental health and substance-use treatments are deemed "essential health benefits" under the ACA. Priority will be given to prevention, wellness care, and services which are high quality and cost-effective, as our nation moves our health care system towards population health-based care, rather than stressing individual acute care episodes. Intensive, and most costly healthcare services (Emergency Department and Inpatient Care, and risky medication interventions without scientific validity relative to efficacy) have been defined as "unsupported and non-reimbursed" for the first time in America). Psychologists are the most skilled and available doctorate level workforce in the area of mental illness, substance abuse, and behavioral and lifestyle aspects of many serious and chronic physical illnesses.

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Psychologists have developed scientifically validated and field tested treatments and team leadership abilities along with traditions that position the discipline well to serve the public's health. While the science related to the significant incidence of mental illness and substance abuse disorders and the behavioral and lifestyle aspects of chronic physical illness in our nation's Primary Care Centers and CommunityHospitals, the traditions of the Medical Model, which dominates our healthcare system, "only define medical practitioners as essential providers needed in adequate volume in health facilities." Such unscientific and tradition-based thinking cripples our health facilities and our laws and regulations in America today. Psychologists, and psychological interventions and programs are "essential" for quality diagnosis, treatment, and leadership in the nation's healthcare facilities and will not be there in substantive numbers until traditions are over-ruled by statute, regulation, and ensuing accreditation standards. Facilities that realize this will be recruiting psychologists and putting them on consulting medical staff (the position now reserved for specialists like psychiatrists, cardiologists, neurologists, etc., and positioning them to attend medical staff and organizational leadership functions and supply expert suggestions and guidance for program management and development). They will realize that, especially in transition and program and department and staff building eras, a Board Certified Medical Psychologist (see: www.amphome.org) is the best prepared specialist within the many degree types, specializations available, and preparations necessary to head hospital and primary care system psychological leadership functions. Some facilities (maintenance oriented management) have and will resist this and will resist change. They are not early adopters or blessed with entrepreneurial capital and skills.

The ACA calls for the development of integrated, interdisciplinary, and efficacy (read as science) based systems of patient-centered care! This care system will be financially subsidized, adopted by federal payer sources as criterion for pay and play, and by accrediting bodies during this transformation. *Chief among these is the integration of behavioral health and medical health care, where the public sector has consistently financed more than 50% of the budget of most hospitals and healthcare facilities in the nation and demonstrated proactive leadership.* Federal leadership in quality assurance, standards for health facility operation, staffing requirements, equipment and safety requirements, and dependable funding streams of significant magnitude have been one of the most dynamic driving forces in fashioning the nation's community hospitals and primary care centers and public access to local and quality healthcare. Without innovation, change, and leadership from our Government and regular intervention and upgrades in healthcare historically, the best healthcare system in the world would not exist[3].

The new iteration of healthcare's foundation and infrastructure (workforce refinements, payer modifications, technical and electronic refinements to modernize, regulatory refinements to establish safety and accessibility, and efficiency refinements) is steadily being put in place for bringing the advances occurring within the scientific application and rational direction of scarce healthcare resources. It includes supervision of doctors and healthcare facilities (through connectedness, data mining and evaluation, and program and service evaluation) fostered by uniform communications and health information technology (HIT). For the first time we have a nearly "real time" picture of what facilities and doctors are doing, good at, and where improvements need to be made. We have "real time data" that helps to catch fraud and abuse early in the cycle prior to loss of significant scarce resources. For the first time, doctors needing more training and skill will be easily identified and assisted. For the first time patients will have actual facts and data upon which they can make rational choices of providers and facilities. To resist this is to adopt "market myopia"[4].

I have colleague psychologists who have been hired by hospital and primary care systems to begin this transition and within a month they are fully booked, building programs that

are revenue and census positive for the healthcare facility. These doctors of psychology have support of their usually over-worked and exhausted medical staff colleagues for whom they are providing more comprehensive and available referral and collaboration options. These doctors are appreciated by their healthcare administrators (who are generally strapped to increased utilization and revenue streams to replace inpatient census and non-paid unscientific and not medically/psychologically necessary service delivery in this more supervised healthcare era) and who will be increasingly tasked to provide contracting organizations with comprehensive and effective care that is scientifically demonstrated and data supported. They are providing patients with increased access and choice relative to a wider array of credible and demonstrated effective interventions and professionals. Only those investing in "market myopia" could oppose that change[4].

Many of us have been writing about, calling for, and goading, the American Psychological Association and other groups to make this a top Public Service and Psychology Practice initiative since the 1990s[5, 6, 7, 8]. Any psychological, medical, and Governmental group that is dedicated to science, rational public health initiatives, and positive economic management must bow to this as a priority. In reality, a lot of healthcare rules and statute, management, design, and delivery are not rational or scientific and we have historically paid great human, economic, and systemic prices for this situation. I do suspect that much of that will continue and that those who attempt rational and science and economic discussion of these issues will face hostility, opposition, and arguments ad hominin as have the innovators who designed the ACA.

Basing healthcare on science is a change of tradition, but not appearance. Medicine and healthcare have long been sold as "scientific." That is simply not the reality as anyone who knows the history of medicine and healthcare understands[9].This is based on hard and extant science that has been around for a long time and repeatedly replicated that general physicians in the nation's hospitals and primary care centers are not trained and do not adequately diagnose and get linked with proper treatment individuals and families with mental illness and substance use disorders[10,11]. We have written and advised repeatedly that "only by requiring a community hospital and primary clinic psychology and/or psychiatry workforce and making them regularly available will the quality of care and access barriers to appropriate care be achieved"[12]. As the Executive Director of the Academy of Medical Psychology I get regularly called upon to help hospitals and primary care systems identify Board Certified Medical Psychologists or Medical Psychologists in training who are interested in recruitment and assistance with transitions to Integrated Care Models[13]. I have spoken at physician groups like the American College of Lifestyle Medicine to assist them in their vision or more scientifically driven, healing and long-term health maintenance oriented medical practice[14]. A new era is here, but like Theodore Levitt admonished "some will continue to make buggy whips"[4].

A driving force that will move hospital administrators to include psychologists on medical staffs is the changing payment methods and philosophies. As a nation, we are moving from reimbursement for scientific clinical procedures, per patient per month reimbursement (rather than procedure based). Still, as I noted in my book in the 1990s, physicians and healthcare administrators don't know how in-depth is the psychologist's education and skills, and what we can do! Their education has been restricted to what physicians can do and the distorted and self-serving reasoning that "no other disciplines are really healthcare professionals and can diagnose and treat patients effectively and lead healthcare teams." By definition, anything that is a self-serving belief that does not fit reality and the facts is "a delusional thought or system"! Healthcare administrators have a delusional system that is reinforced by the medical model and Medical Industrial Complex and lots (and I mean lots) of primary reinforcers. These belief systems, like all delusions, serve them well and gather many core primary reinforcers and will not give way easily!

Now some will say, “Dr. Morris, are you really boldly saying that many healthcare administrators and physicians are delusional”? The answer is a resounding “Yes” in the sense that every prejudice is a mild “delusion” as well discussed in Dr. Gordon Allport’s book on the subject in the 1940s! The world knows that mild delusions or prejudices can have major consequences and have plagued civilizations and the world with negative consequences for years! Nothing, other than the actual science confirming for years the efficacy and value of psychologists and psychological interventions and advanced diagnostics, is more confirming of these delusional systems than the “psychiatrists prejudicial and hysterical and distorted claims for year about the damage prescribing psychologists and nurse practitioners would do”! None of that was science based, and none of it has come true! Nothing, other than the lack of accurate and complete communication of the preponderance of science (or possible conscious hucksterism), illustrates this better than the fact that the consistent medical prognostication (with multiple medicines such as amphetamines, benzodiazepines, antidepressants, pain medicines, neuroleptics, NASAIDS, etc.) that “these drugs are safe for long-term use” illustrates a delusional system that impairs the judgment and leadership of those at the core of the Medical Industrial Complex!

Think about the constant position of physicians, drug companies, healthcare administrators designing and rolling out programs, and Government lawmakers “drinking the delusional cool-aid of the Medical Industrial Complex,” and all its primary and secondary reinforcers, that “these medications are safe for long-term or life-time biological rebalancing! Or, that drugs are treatments in and of themselves for mental disorders or pain could illustrate an “unrealistic positive drug bias, prejudice, or delusion”! We are drifting inevitably towards encouraging moving beyond the overly simplistic bio-reductionistic and medication dependent healthcare delivery model, and toward focus on long-term health and life-style healthcare rather than “brushfire medicine.” Still, the Medical Industrial Complex will likely counter by avoiding broadening the required staffing of healthcare facilities and their control of the American healthcare industry. They will fight the revision of healthcare laws and regulation to allow non-physician and established effective doctors of psychology to function within the full scope of their diagnostic and treatment training and licensure. They will create oversimplified sham competency to do this within the existing medical model by establishing superficial “workshop training,” or “redefinition of psychology as a technique (such as CBT, DBT, or “health counseling”) that can be learned in a few days study. This will supplement and amplify the general physician’s position at the core of the healthcare system alone and without balancing disciplines and dynamics in leadership, maintain the Medical Industrial Complex tripartite of physicians, drug companies, and hospital and health facilities corporates, not refine it.

To accomplish refinement of the healthcare system a law will not do it for us! We will have to have the foresight, flexibility, and willingness to move from the medical to the Integrated Care model and change the context related to the model, culture, and players! One big step, among many necessary, is to add psychologists to our best and forward looking Primary Care Centers and Hospitals. That singular act, though not sufficient to make meta-change, would force a rebalancing of the system toward a more holistic and health and healing focus. The addition of psychologists in these healthcare facilities would serve to block over medicalization and bio-reductionist approaches and would enrich treatment plans. The addition of psychologists in these facilities would help to contrast real change against superficial change in giving medical personnel a little more superficial training in an effort to feign serious interest and expertise in non-medical approaches! The addition of psychologists in these front line and hub healthcare facilities would cross fertilize medical and behavioral personnel for greater insight into the wonderful things each discipline has to offer and the exciting teamwork that is available in the future.

We simply will not be able to attend a community's substance abuse, psychological, and behavioral aspects of chronic medical and lifestyle disease without major revisions of workforce requirements and health facility rules and traditions that attract and keep the best psychologists and lifestyle medicine physicians. There will simply never be enough psychiatrists in the workforce to fill this need (and they have vacated psychotherapy and behavioral interventions for "medication only' techniques, often defining themselves as "psychopharmacologists" that what was traditionally thought of as "psychiatrists"). Additionally, the illusion of thinking that a general physician supervised mid-level provider will be able to adequately lead these specialty services and programs and staff, adequately provide the advanced diagnostics and adequate treatment plans, and handle the administrative leadership in these clinical programs simply will remain at the fantasy and wish level perpetuating a sham integrated care model which is really "lipstick on a pig" and perpetuating the problems of the medical model and excessive bio reductionism and over-reliance on medications to solve complex health and lifestyle problems[15,16,17.18]. Mid-level providers in behavioral healthcare need the senior and complex diagnostics and supervision and guidance and support that they need in medicine. Without this you will build systems in which the complex and most difficult cases and healthcare programs cannot succeed! Literally the more MSWs, LPCs, Certified Substance Abuse Counselors, Case Managers, RNs, MSNs, and prevention and peer specialists you have in a system the more Senior Doctors of Medicine and Psychology you will need to have successful and effective programs. Such efforts give a rich, creative, and affordable workforce capable of great things and high volume, but they simultaneously create a situation for great failures, stressors, and great supervision and leadership demands on senior clinicians who are already stressed by increased patient demands, scientific complexity, and change!

While we are the best healthcare system in the world, we are also one of the most poorly managed and regulated, prone to squander scarce resources that can be better and more rationally deployed, and we have let one discipline dominate the entire system to their advantage for years and recently a second discipline (Corporate: hospital, insurance, and healthcare corporations) enter and do the same. This fundamental shift in emphasis, or what I've called a "sea change" in several publications over that last five years, is expected to result in the U.S. no longer being ranked by the Commonwealth Fund as last among developed nations on overall measures of health system quality, efficiency, access to care, equity, and healthy lives, as compared with Australia, Canada, France, Germany, the Netherlands, New Zealand, Norway, Sweden, Switzerland, and the United Kingdom. Still, we squander larger percentages of GDP on healthcare than we can afford, even though most Americans value physical and mental health as among their highest aspirations, possessions, and priorities. We resist change and guard this checkered status quo. We delusionally pretend about many things in our healthcare system to make ourselves feel emotionally comfortable, superior, and like we have answers that have been recycled with new labels as "old wine in new bottles." The result of what the ACA becomes and solves or causes is not in the law, but in our hands!

References

1. Patient Protection and Affordable Care Act (P.L. 111-148). PUBLIC LAW 111–148—MAR. 23, 2010.
2. Mental Health Parity Act Rules: Federal Register, Part IV, Department of the Treasury Internal Revenue Service, 26 CFR Part 54, Department of Labor Employee Benefits Security Administration, 29 CFR Part 2590. Department of Health and Human Services, Centers for Medicare & Medicaid Services, 45 CFR Part 146, Interim Final Rules under the Paul Wellstone and Pete Domenici Mental Health Parity and Addiction Equity Act of2008; Final Rule; http://www.gpo.gov/fdsys/pkg/FR-2010-02-02/pdf/2010-2167.pdf .

3. Institute of Medicine (U.S.), National Academies of Science, Advising the Nation. Improving Health. *Improving the Quality of Health Care for Mental and Substance-Use Conditions: Quality Chasm Series.* http://www.nap.edu/catalog/11470.html. Pages 1-504,2006.
4. *Levitt on marketing, 1991, Boston, Mass. : Harvard Business School Press*
5. Morris, J. A. (Ed.) (1997). *Practicing Psychology in the Rural Setting: Hospital Privileges and CollaborativeCare.* Washington, DC: AmericanPsychological Association.
6. Morris, J. A. (1995). Alcohol and Other Drug Dependency Treatment: A Proposal for Integration with Primary Care. *Alcoholism Treatment Quarterly,* 13(3),4556.
7. Morris, J. A. (1986). Interdisciplinary treatment of alcoholism. *Alcoholism Treatment Quarterly,* 3(4),125-131.
8. Bray, J. H., &Rogers, J. C. (1995). Linking psychologists and family physicians for collaborative practice. *Professional Psychology: Research and Practice*, 26, 132-138.
9. The Burns Archives. http://www.burnsarchive.com/Explore/Medical/index.html
10. Kunen, S., Niederhauser, R., Smith, P., Morris, J.A., &Marx, B. (2005). Race Disparities in psychiatric rates inemergencydepartments.*Journal of Consulting and Clinical Psychology, 73* (1), pp.116-126.
11. Kroenke, K., & Manglesdorff, D. (1989). Common symptoms in ambulatory care: Incidence, evaluation, therapy, and outcome. *American Journal of Medicine, 86*, pp. 262-266.
12. Morris, J.A. (2013). Changes in Medicare Hospital and Healthcare Facility Rules Affecting Psychology. Archives of Medical Psychology, August 2013 • Volume 4, Issue 1. P. 22-27.
13. Academy of Medical Psychology. www.amphome.org .
14. American College of Lifestyle Medicine. http://www.lifestylemedicine.org/
15. Cummings, N. A., Dorken, H. Henke, C., &Pallak, M. (1989). *The impact of psychological services on medical utilization in a Medicaid population.* Report on the Hawaii MedicaidStudy. Baltimore: Health Care Financing Administration.
16. Cummings, N. A., &Follette, W. T. (1968). Psychiatric services and medical utilization: An eight year follow up. In H. Dorken & Associates (Eds.).*The professional psychologist today.* San Francisco: Josey-Bass.
17. Cummings, N. A., Kahn, B.I., &Sparkman, B. (1965).*The effect of psychological intervention on medical utilization: A pilot project.* Oakland, CA. Kaiser Foundation Reports.
18. Cummings NA, O'Donohue WT, Cummings J L .JClin Psychol Med Settings. 2009 Mar; 16(1):31-9. Epub 2009 Jan 11.
19. Caccavale, J., Cummings, N., Morris, J., Reinhardt, D., Rubin, H., and Wiggins, J. (2010b) Failure To Serve: *A White Paper on The Use of Medications as a First line Treatment AndMisuse in Behavioral Interventions This report was prepared by:* The National Alliance of Professional Psychology Providers, www.nappp.org.

The Practice of Rural Medical Psychology

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Abstract

Rural and urban psychologists are increasingly being impacted by the Healthcare reform and the Affordable Care Act (ACA), which is redirecting the majority of care through the Primary Care and Community Hospital systems, utilizing an Integrated Care Model. This model increasingly breaks down silos, co-locates behavioral health and substance abuse professionals alongside physicians, mid-level providers and nurses, and seeks more comprehensive and long-term focused treatment rather than palliative and control-oriented treatment, e.g., psychotropic only approaches, or diabetes medications only, or hypertension only, etc. approaches to chronic illnesses with lifestyle components and causes. The ACA emphasizes "scientifically validated interventions" as eligible for reimbursement, and performance-based "meaningful use" contracting that activates incentive pay for appropriate referrals to other specialists. Rural and urban psychologists alike will need to decide how they will position themselves in this new paradigm, within an integrated care practice or outside.

Rural Health Clinic

In rural America, there are over 46 million citizens who face ongoing challenges in accessing health care.[1] Historically, rural residents have struggled with issues related to access to care, recruitment and retention of health care providers of all disciplines, and maintaining the economic viability of hospitals and health care providers in isolated rural communities. Rural areas also continue to suffer from a shortage of diverse providers for their communities' health care needs and face workforce shortages at a greater rate than their urban counterparts.[2, 3] Of the 1,976 rural counties in the United States, 1,550 are primary care Health Professional Shortage Areas (HPSAs).[4] Rural residents have higher rates of age-adjusted mortality, disability, and chronic disease than their urban counterparts.[5] President Obama's "Improving Rural Health Care Initiative" strives to build healthier rural populations and communities through evidence-based practices. Rural America is where Medical Psychology can truly make a demonstrable difference in the lives of so many Americans.

Developing a Certified Rural Health Clinic (RHC) is an avenue for entrepreneurial rural Medical Psychologists to contribute to the quality of care for rural Americans and merge with the healthcare zeitgeist. A Certified Rural Health Clinic is a federal program designed to encourage and stabilize the provision of basic outpatient primary care in underserved rural areas through the use of physicians, physician's assistants (PA), nurse practitioners (NP), and certified nurse midwives (CNMs). (See Table 1 for the Federal Register reference numbers describing the rules and regulations).

To be eligible for RHC certification, the clinic has to be located in a specially defined and designated rural area. There are four definitions: 1) Census Bureau designations as "non-urbanized," 2) a federally designated HPSA, 3) a federally designated Medically Underserved Area (MUA), 4) or an area designated by the state's governor as underserved. RHC's are certified by the state's Department of Health.

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Table 1

Rule Health Clinic act-PL-95-210:	This is a basic overview of the critical issues and planning needed to meet the Rural Health Clinic Act.
Federal Register Section 491:	This section of the Federal Register establishes the regulations and sets the conditions for certification of all Rural Health Clinics.
Federal Register Section 405.24:	This section of the Federal Register establishes the scope of services, and payment by Medicare for those services of Rural Health Clinics. It also includes scope of services for Federally Qualified Health Clinics (FQHC).

The minimum scope of services include diagnostic, therapeutic services commonly furnished in a physician's office, i.e., basic lab services (six tests- chemical examination of urine, hemoglobin or hematocrit, blood sugar, examination of stool specimens for occult blood, pregnancy test, transmittal); and emergency services (first response to common life-threatening injuries and acute illnesses, including having available drugs used commonly in life-saving procedures). Also, RHC's arrange for other needed services provided through arrangement/referral.

Staffing requirements include one or more physicians, and one or more PAs, NPs, or CNM. The midlevel provider must be on-site to see patients 50% of the time the clinic is open for patients. Many RHC's are primarily manned by midlevel providers whose collaborative physician drops in a couple of hours per week to review and sign-off on charts. Optional staff includes licensed psychologists and clinical social workers. *Any of these providers are eligible to be owners.*

Financial incentives are built in to encourage health care providers to develop RHC's. Compensation is a flat rate per visit regardless of the procedure provided. For complicated patient needs, it is preferable to refer them to urgent care or a specialist. Each year a cost report must be filed with the RHC's local Center for Medicare and Medicaid Services (CMS) which determines the reimbursement rate for the year. The RHC federal regulations encourage services to Medicaid and Medicare recipients, so the cost report formula translates into higher compensation when serving the lower socioeconomic patients while financially discouraging serving patients with commercial insurance. The compensation rate is approximately 25% higher than the non-RHC Medicaid/Medicare rate. If the RHC is provider-based (affiliated with a hospital) there is an additional "hospital fee" on top of that (about 50% more).

Why Link Primary Care and Mental Health Care?

There are opportunities for psychologists in primary care.[6] The ACA reconfigures the healthcare delivery system with a marked focus on primary care, promoting increased collaboration between medical and mental health/substance abuse specialists via co-location, for cost-savings associated with improved patient health outcomes and provider accountability. The development of an RHC fits with this model. The majority of patients with mental illness are seen in primary care centers.[7, 8, 9] This suggests the majority of the population seeking treatment remains naïve and believes that medication is an appropriate, standalone treatment for mental health disorders. The high prevalence of substance abuse and mental illness indicates that between 1 in 7 and 1 in 4 individuals entering a primary health care system will have a diagnosable substance abuse, mental health problem, or both.[10]

Patients with Major Depression tend to be high utilizers of general medical services. In the Epidemiologic Catchment Area Study, Simon and colleagues[11] showed that males with depression had a 50% greater risk and females with depression had an over threefold greater risk of being high utilizers of general medical services (defined as greater than six visits in six months) compared with controls without mental health disorder. The "hallway handoff" has become the catchphrase for the collaborative process between psychologists and physicians in integrated care settings.[12]

Advantages of psychologist owned RHC's

Such a healthcare model encourages more convenient, comprehensive, and improved quality of care. Patients presenting for physical problems often need mental health referrals (psychological evaluation, medication, and therapy). For example, Fries and colleagues[13] found nearly 70% of all health care visits have primarily a psychosocial basis. Similarly, mental health patients will have co-morbid physical problems, or need a physical examination and lab work to rule out medical contributions to their mental health symptoms. For the psychologist owner, this business model is potentially a more profitable environment than the traditional private practice model.

One longstanding and well-known gap in mental healthcare, rural and urban, is limited patient access to psychiatrists. General practitioners write 59% of psychotropic scripts.[14] To adjust to this market reality, a medical psychologist-owned RHC allows for convenient Level II psychopharmacology consulting and referral to the medical provider, or level III prescribing for psychologists in states with prescription privileges, and improves profitability. Further, psychologist ownership affords the opportunity to develop policies that are supported by the science and simultaneously financially beneficial, such as psychotropic refills being contingent upon being in treatment. Patients do not have to be held hostage, as they can be encouraged to seek treatment elsewhere if desired but simply provide documentation.

A psychologist-owner of a RHC can train medical staff to be alert for medical manifestations of mental disorders. For example, the 10 most common problems brought to adult primary care are back pain, shortness of breath, insomnia, abdominal pain, numbness, chest pain, fatigue, dizziness, headache, and swelling. Ninety percent of the 10 most common complaints in primary care setting have no organic basis.[15] Stress, a cognitively-medicated response, has many physical manifestations.

Due to the trend for health care systems to merge into bigger, more comprehensive systems, Primary Care Centers like RHCs are often associated with centralized community hospital systems. These systems are increasingly becoming Health Care Homes (HCH) under the reconfiguration catalyzed by the ACA. In these HCH's, behavioral health providers are a requirement. This is an opportunity for entrepreneurial Medical Psychologists to develop a successful RHC clinic that could be an attractive acquisition for a community hospital system. Further, the psychologist-owner could negotiate to fill the ACA-required HCH behavioral health provider position. In this configuration, the Medical Psychologist has the opportunity to significantly positively impact the ACA-targeted disease categories such as CVD, COPD, Metabolic Disorders, mental illness and substance use disorders. Medical psychologists are an invaluable resource for many of these patients with these complaints, as we see that behaviors, lifestyle, family system dynamics, and ineffective stress and coping are covariables. Lifestyle is highly relevant. The following is a discussion of the codes that make this possible.

Behavioral Health Assessment and Intervention Codes

Within the Affordable Care Act, there are categories of disorders that are targeted for focused integrated care, such as cardiovascular disease (CVD), chronic obstructive

pulmonary disease (COPD), metabolic disorders such as obesity and diabetes, mental illness, and substance abuse. Individuals with a combination of any two of these disorders are given special consideration. These patients, especially the uninsured ones, are a significant contribution to the health care cost inflation. These are complex and difficult patients to treat, and historically they have not received integrated care. The medical establishment is plagued by inadequate staffing of primary care and hospital facilities for behavioral health-related issues, and struggle with time constraints based on rapid paced and symptom- and protocol-oriented care.[16] The ACA now incentivizes this much-needed integrative process within the performance contracting component, drop-down menus and "meaningful use", on top of per patient per month reimbursement. If health care systems case manages these patients with appropriate referrals and linkages, incentive pay is available.

Until now, almost all intervention codes used by psychologists involved psychotherapy and required a mental health diagnosis, such as under the DSM-V. In contrast, Health and Behavior Assessment and Intervention (HBAI) services focus on patients whose primary diagnosis is physical in nature. Rural Medical Psychologists should know about these codes and use them.

These codes capture services addressing a wide range of physical health issues, such as patient adherence to medical treatment, symptom management, health-promoting behaviors, health-related risk-taking behaviors, and overall adjustment to physical illness. In almost all of these cases a physician will already have diagnosed the patient's physical health problem. HBAI procedures are used to identify the psychological, behavioral, emotional, cognitive, and social factors important to the prevention, treatment, or management of physical health problems. The focus is not on mental health, but on the biopsychosocial factors important to physical health problems and treatments.

The two assessment codes are 96150 and 96151. The former refers to the initial assessment of the patient to determine the biological, psychological, and social factors affecting the patient's physical health and any treatment problems. The latter is the code required for a re-assessment of the patient to evaluate the patient's condition and determine the need for further treatment. A re-assessment may be performed by a clinician other than the one who conducted the patient's initial assessment.

There are four intervention codes: 96152, 96153, 96154, and 96155. Code 96152 is the intervention service provided to an individual to modify the psychological, behavioral, cognitive, and social factors affecting the patient's physical health and well being. Examples include increasing the patient's awareness about his or her disease and using cognitive and behavioral approaches to initiate physician prescribed diet and exercise regimens.

An intervention service provided to a group of patients would utilize Code 96153. An example is a smoking cessation program that includes educational information, cognitive-behavioral treatment and social support. Group sessions typically last for 90 minutes and involve eight to 10 patients. Noffsinger[17] has written about Group Medical Visits (GMV), or shared medical appointments, as a model in which multiple patients are seen as a group for follow-up or routine care with their PCP and other members of the team. The group visit is conceptualized as an extended doctor's office visit where not only physical and medical needs are met, but educational, social and psychological concerns are dealt with effectively. These visits focus on a disease entity (hypertension, diabetes) or specific populations (hearing impaired, orthopedic).

Code 96154 is the intervention service provided to a family with the patient present. For example, a psychologist could use relaxation techniques with both a diabetic child and his or

her parents to reduce the child's fear of receiving injections and the parents' tension when administering the injections. Similarly, there are times when it is clinically indicated to exclude the primary patient from a family intervention session. In this circumstance, the 96155 code would be used to work with a family without the patient present. An example would be working with parents and siblings to shape the diabetic child's behavior, such as praising successful diabetes management behaviors and ignoring disruptive tactics.

It is important to recognize this is not psychotherapy. These codes differ from therapy. If a mental health clinician is treating a patient with both a physical and mental illness he or she must pay careful attention to how each service is billed. HBAI codes cannot be used for psychotherapy services addressing the patient's mental health diagnosis nor can they be billed on the same day as a psychiatric CPT code. The clinician must report the predominant service performed.

Use of HBAI codes will enable reimbursement for the delivery of psychological services for an individual whose problem is a physical illness and does not have a mental health diagnosis. Since these codes are new, reimbursement rates from the private sector have not been determined. However, it is important that psychologists begin to use these codes now to accurately capture the services provided.

The scope of the need for Medical Psychologists

The Adverse Childhood Experiences study[18] reveals the scope of the need for Medical Psychologists who understand and use the HBAI codes. The ACE study is an ongoing 17,000 participant study between the Centers for Disease Control and Kaiser Permanente that examines the relationship between childhood adversity and trauma to long-term health and social consequences. ACE was defined as childhood abuse (emotional, physical, sexual), parental separation or divorce, domestic violence, household substance abuse or mental illness, and incarcerated household members. The participants score is determined by the number of endorsed adversities they experienced during childhood. These traumatic experiences are common, as nearly two-thirds of study participants reported at least one ACE, and more than one of five reported three or more ACE. The ACE Score was used to assess the total amount of stress during childhood.

It was found that as the subject's ACE score increased, so did their risk for the following adverse health outcomes: substance use disorder, chronic obstructive pulmonary disease, depression, fetal death, ischemic heart disease, liver disease, risk for intimate partner violence, multiple sexual partners, sexually transmitted diseases, smoking, suicide attempts, unintended pregnancies, early initiation of smoking, early initiation of sexual activity, and adolescent pregnancy. Notice several on this list are traditionally considered "medical problems." This study powerfully reveals how childhood exposure to adversity and trauma is strongly associated with a multitude of health and social problems.[19] Thus, interpersonal dynamics and family functioning is highly influential in the developing child's behavioral choices, personality development, and long-term consequences manifesting as susceptibility to disease and various co-morbidities.

Treatment Considerations

Personality development is primarily a function of two factors—genes and the environment. The genetic code with which each person is endowed at conception contains a range of potentials available to be realized.[20, 21] The dynamic interplay between genes and the environment result in phenotypic expression that is either positive and adaptive or negative and harmful. It is now clear that genes do not function in a fixed, deterministic fashion, but more like "switches" that can be activated or suppressed depending on the environment, experience, and the organism's behavior.[22, 23, 19]

The application of psychotherapy to mental illness is a health care intervention that exploits this scientific reality that experience alters phenotypic expression. This process is strategically applied to modify genes and brain structure through the process of neuroplasticity, resulting in adaptive changes in personality.[24]

Beyond simply providing psychotherapy, the Medical Psychologist's vital contribution is to lead the health care team, the patient, and family in the development and implementation of a comprehensive treatment plan that addresses the person's health care needs holistically. This adds considerable structure and sophistication on a number of inter-related levels.

Comprehensive treatment plans are biopsychosocially conceptualized. With regard to the *bio* component and basic physiological issues, helping the patient adopt and maintain a proper diet, obtain consistent and adequate exercise, implement sleep hygiene, and acquire stress management skills via mindfulness meditation and yoga, are examples of essential skills and priorities for overall health and well-being. When co-morobid diseases exist, referring to and collaborating with other health care specialists is applicable.

Psychotropic medications fall into this category, and are often an appropriate, short-term technique within a comprehensive treatment plan. While they may control 25% of the symptoms of these SMI disorders, they have never been a stand alone treatment. Drugs do not significantly curb the course of the illness, but tranquilization and interfering with firing of neurons (calcium and ion channel blockers) are helpful techniques. Tranquilizing a person with vast immaturity, poor judgment and insight, impulsive and under-modulated and intense behavior can be helpful while they are in the early stages of treatment. Importantly, with antipsychotics, there is no appreciable difference in efficacy except in side effects.[25] One is as useful as another, and an augmentation strategy with any mood stabilizer (neuron firing interference) can be useful, too. Essentially, psychotropics disrupt the brain's typical neuronal patterns of transmission so the patient cannot be himself. This purposeful disruption dampens troublesome symptoms and buys the treatment team time to capitalize on the neuroplasticity of the brain as the bio-*psycho*-social component is addressed through psychotherapy, skill development (e.,g., impulse control and anger management education, emotional literacy training, and cognitive retraining).

The bio-psycho-s*ocial* context and outcomes must be addressed, as the ACE study illustrated. With social skills, communication and assertiveness training, reparenting by the treatment team, resocialization, and environmental engineering the individual grows, changes, and acquires new skills sets via neuroplasticity that enable them to eventually fill adult roles. A crucial element is competent family assessment and therapy, as evidenced by the ACA's inclusions of the highly-structured Multi-systemic, Assertive Community Treatment, and Behavioral Family therapies in the law for SMI patients. SMI patients typically need this intensive family assessment and therapy, as there are invariably family members that need intensive individual therapy to allow the primary patient to individuate and mature. A private practitioner psychiatrist or psychologist really cannot effectively treat these patients unless they have strong linkages with agencies and appropriate intensive and structured programs.

SMI patients (Bipolar disorder, Schizoaffective disorder, Schizophreniform, Schizotypal, and Schizophrenic patients) are developmentally "infants or children" and need years of maturation triggered by intense and positive external structure such as Day Treatment with multi-disciplinary interventions and staff, high structure until identification and internalization of new part-objects can occur to enhance self-regulation, and brain growth and neuroplasticity occurs. They need repeated and long-term training, constant redirection, assertive case management and monitoring, lots of context and family change, lots of pa-

tience and commitment from the "Reparenting Therapeutic Team." Medical psychologists are the best trained health care professionals for this treatment leadership role.

Conclusions

The ACA is reforming the way health care is practiced with a focus on a team service-delivery model within primary care. Opportunities exist for rural Medical Psychologists to participate. Rural Health Clinics can be developed, owned and operated by the entrepreneurial Medical psychologist, improving the quality of care for rural Americans and merging with the current healthcare zeitgeist. Primary care clinics are increasingly integrating with Community Hospital Systems and RHC's can potentially be positioned to be desirable for acquisition by a Community Hospital System. This paves the way for the rural Medical Psychologist to be squarely in the middle of where modern health care is delivered.

Within this context, there are a number of chronic diseases the rural Medical Psychologists can positively impact, utilizing Health and Behavior Assessment and Intervention codes, raising the level of sophistication to the treatment of mental illness, various physical disorders, and individuals with co-morbid disorders. This enables the rural Medical Psychologist to increase the quality of care in their community and for their associated Health Care Home.

References

1. Calculated using 2010 Census Data and 2013 OMB nonmetropolitan county Designations
2. Doescher, M., Fordyce, M., Skillman S., WWAMI Rural Health Research Center Presentation: The Aging of the Rural Generalist Workforce. February 2009.
3. Area Resource File (ARF), 2008. US Department of Health and Human Services, Health Resources and Services Administration, Bureaus of Health Professions, Rockville, MD.
4. WWAMI Rural Health Research Center. Aging of the rural generalist workforce. Seattle, WA: WWAMI Rural Health Research Center, University of Washington, July, 2009.
5. Economic Research Service (August 2009). Health Status and Health Care Access of Farm and Rural Populations. Economic Information Bulletin Number 57. Washington, D.C. U.S. Department of Agriculture
6. Vogel, M., Kirkpatrick, H., & Fimiani, M. (2008) Integrated Training and Practice in Primary Care: Postdoctoral Psychology Fellowship and Medical Residency Training Partnership at Genesys Regions Medical Center in Gran Blanc, Michigan. *The Register Report,* Fall.
7. Brody, D. S. (1996). What is the role of the primary care physician in managed mental health care? In A. Lazarus (Ed.), *Controversies in managed mental health care* (pp. 29-40). Washington, DC: American Psychiatric Press.
8. Regier, D. A., Goldberg, I. D., & Taube, C. A. (1978). The de facto U.S. mental health services system: A public perspective. *Archives of General Psychiatry, 35,* 685-693.
9. Schulberg, H. C., & Scott, C. P. (1991). Depression in primary care: Treating depression with interpersonal psychotherapy. In C. S. Austad & W. H. Berman (Eds.), *Psychotherapy in manage health care: The optimal use of time and resources* (pp. 153-170). Washington, DC: American Psychological Association.
10. Morris, J. A., & Wise, R. P. (1992). The identification and treatment of the dual diagnosis patient. *Alcoholism Treatment Quarterly, 9,* 55-64.
11. Simon, G. E. (1992). Psychiatric disorder and functional somatic symptoms as predictors of healthcare use. *Psychiatric Medicine, 1992; 10(3)*: 49-59.
12. Laygo, R., O'Donohue, W.T., Hall, S., Kaplan, A., Wood, R., Cummings, J., Cum-

mings, N., & Shaffer, I. (2003). Preliminary results from the Hawaii integrated healthcare project II. In N.A. Cumming, W.T. O'Donohue, & K. E. Ferguson (Eds). *Behavioral Health as Primary Care: Beyond Efficacy to Effectiveness*. Reno, NV. Context Press.
13. Fries, J.F, Koop, C.E., Beadle, C.E., Cooper, P.P., England, M.J., Greaves, R.F., Sokolov, J.J., Wright, D., and the Health Project Consortium. *Reducing Health Care Costs by Reducing the Need and Demand for Medical Services*. New England Journal of Medicine 1993; 329:321-325.
14. Mark, T.L., Levit, K.R., and Buck, J.A. (2009). Datapoints: psychotropic drug prescriptions by medical specialty. *Psychiatric Services,* Sep 60(9).
15. Kroenke, K. & Mangelsdorff, A. D. 1989). Common symptoms in ambulatory care: Incidence, evaluation, therapy and outcome. *American Journal of Medicine, 86,* 262-266.
16. Morris, J. A. (2013). The Golden Age of Psychology: Serving the Public Health Facilities' Need in the Age of Integrated Care. In J. Caccavale (Ed.). *Medical Psychology Practice and Policy Perspectives* (pp. 205-222). NAPPP books.
17. Noffsinger, E. B. (2009). *Running Group Visits in Your Practice* (1st ed.). Springer.
18. www.cdc.gov/ace/outcomes.htm.
19. Felitti, V. J., Anda, R. F., & Nordenberg, D. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults. *American Journal of Preventive Medicine, 14*, 245-258.
20. Gilliam, T. C., Kandel, E. R. & Jessell, T M., (2000). Genes and Behavior. In E. R. Kandel, J. H. Schwartz, & T. M. Jessell, Eds., *Principles of Neural Science,* 4th edn. Norwalk, CT: Appleton & Lange, pp. 36-62.
21. Kramer, D. A. (2005). Commentary: gene-environment interplay in the context of genetics, epigenetics, and gene expression. *Journal of the American Academy of Child and Adolescent Psychiatry, 44*(10), 19-27.
22. Hicks, B.M., South, S.C., DiRago, A.C., Iacono, W. G. & McGue, M. (2009). Environmental adversity and increasing genetic risk for externalizing disorders. *Archives of General Psychiatry*, *66*(6).
23. Valiente-Barroso, C. (2014). Brain Plasticity Associated with Meditation Experience: Neurofunctional Approach and Structural Findings. *International Journal of Brain and Cognitive Sciences*, *3*(1), 6-24.
24. Folensbee, R. (2007). *The Neuroscience of Psychological Therapies*. Cambridge University Press.
25. Lieberman, J.A., Stroup, T.S., McEvoy, J.P., Swartz, M.S., Rosenheck, R.A., Perkins, D.O., Keefe, R.S., Davis, S.M., Davis, C.E., Lebowitz, B.D., Severe, J., Hsiao, J.K. (2005). Effectiveness of anti-psychotic drugs in patients with chronic schizophrenia. *New England Journal of Medicine*, *353*(12); 1209-23.