Experimental

TRANSFORMATIONAL BREATH WORK IN MEDICAL ILLNESS: *Clinical Application and Evidence of Immunoenhancement*

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Abstract

The term "transformational breath work" commonly refers to techniques which use the breath for inducing altered states of consciousness to promote healing on any level. This paper describes common elements of transformational breath work and rationale for its use in medical illness. It then describes the use of one form, Evocative Breath Therapy (EBT),™ within a group mind/body medicine program. The technique employs an hour-long, four-stage process of focused awareness on the breath accompanied by guided imagery and evocative music. It is designed to induce an altered state of consciousness that promotes expanded self-awareness, self-acceptance, self-compassion, a sense of inner peace, and release of emotional and physical tension. A pilot study was conducted to determine the impact of EBT™ on one indicator of immune function, salivary immunoglobulin A (S-IgA). A heterogeneous sample of forty-five adults (21 cancer patients, 22 healthy others, 2 with other illnesses) contributed saliva samples before and immediately after the experience. A 46.3% increase in S-IgA was found (p = 0.0123, paired-differences t-test). There were no significant differences between cancer patients and others. Effect strength was moderate, .278. Leave-one-out analysis found the effect strength to decrease only marginally, suggesting the results are likely generalizeable to independent random samples. Issues in the use of transformational breath work in clinical programs and implications for further research are discussed.

KEYWORDS: Breath therapy, breath work, immunoenhancement, salivary IgA, energy medicine, mind/body medicine, behavioral medicine, guided imagery

INTRODUCTION

Historically the breath has played a central role in all meditative and spiritual traditions as a crucial link between mind, body, and spirit. In modern times the breath takes a central place in virtually all techniques of mind/body medicine: it is a major focus in elicitation of the relaxation response, a steadying and calming influence while conducting mental imagery, and a tool to facilitate induction in self-hypnosis and hypnotherapy.

Numerous studies have shown that these techniques can enhance certain parameters of immune functioning.[1-6] A relatively unexplored but potentially valuable contribution is the use of transformational breath work techniques intended to evoke altered states of consciousness and emotional release. This article discusses the use of one such technique in a mind/body medicine program, and reports findings of a pilot study on its effects on salivary immunoglobulin A (S-IgA).

TRANSFORMATIONAL BREATH WORK

The twentieth century human potential movement saw the development of a variety of breath-related techniques for inducing altered states of consciousness and emotional release. The methods of Stanislav Grof (Holotropic Breathwork), Leonard Orr (Rebirthing), and Gay Hendricks (Radiance Breathwork) are among the best known forms. These methods have been called "transformational" based on their ability to precipitate profound shifts in people's perceptions and attitudes toward themselves and their lives, as well as changes in patterns of physiological symptoms.

Most forms of transformational breath work share the common elements of an altered state of consciousness, hyperventilation, evocative music, and catharsis. They differ in how they use guidance of a facilitator. Following is a discussion of these elements.

ALTERED STATE OF CONSCIOUSNESS

It is the altered state of consciousness (ASC) that is believed responsible for the profound changes or transformations—psychologically and sometimes

physiologically—that have been observed in breath work. ASC's are of course attainable in a variety of other ways as well, including sensory deprivation, sleep deprivation, shamanistic trances and hypnotic induction, to name a few.

An ASC has both subjective and objective characteristics. Frank Lawlis has summarized the subjective characteristics to include alterations in thinking, disturbed time sense, loss of control, change in emotional expression, body image change, perceptual distortions, change in meaning and significance of perceptions, a sense of the ineffable, feelings of rejuvenation, hyper-suggestibility, a more intense sense of reality, a sense of unity, and altered feedback in the consciousness network.[7]

Objective biological changes include decreased sympathetic arousal, increased parasympathetic activity, shifts away from ordinary cerebral activities (reduced control of the dominant, verbal-analytic hemisphere and asynchronous EEG activity), and increased hemispheric equivalence as indicated by greater hemispheric synchronization.[8] Increased theta wave activity—which is associated with optimal creativity—has also been documented.[9]

HYPERVENTILATION

Most varieties of transformational breath work rely upon extended deep breathing to build a charge of vital energy (qi, prana, or bioenergy) and stimulate the flow of energy through the body-mind continuum. The breathing is variously described as abdominal breathing, yogic breathing, diaphragmatic breathing, connected breathing, or circular breathing. In all cases the focus is on increasing tidal volume (volume of inhalation). This is often complemented by evocative music, imagery, or suggestion, to aid in precipitating the ASC.

On the physiological level breathing is a well recognized mechanism of detoxification, and this may serve as a metaphor for the emotional level as well. The relationship between breathing and emotional arousal and release that occur during breath work is not completely understood. Grof explains it this way:[10]

> What seems to happen is that hyperventilation creates a biochemical situation in the body that allows old emotional and physical tensions associated with

unresolved psychological and physical traumas to surface and become manifest; this offers a unique *opportunity for healing.* This process automatically chooses material with strong emotional charge that is most ready for processing.

From the Taoist energetic point of view, another possible explanation is that the hyperventilation causes a build-up of chi circulating through the person's energy system. As chi moves more forcefully through energetic pathways it dissipates patterns of energy blockage or stagnation which correspond with emotional or physical tension being held in the soft tissue or organs of the body. This release of tension and restoration of the flow of energy possibly leads to improvement of physiologic function and reduction or elimination of symptoms. This may also help explain why people experience spontaneous memories, and the release of emotional charge associated with those memories, during breath work.

Evocative Music

Music is used systematically in some forms of transformational breath work for its ability to evoke changes in emotional state or states of consciousness. Music seems to potentize the process of breath work by simultaneously stimulating both the breathing and emotional experience. Of course, music is a powerful means by itself for inducing an ASC, independently of the influence of hyperventilation. It stimulates the right hemisphere of the brain, by-passing our normal cognitive processing and the filter of our ego defenses. Music and the rhythm of drumming are commonly used in shamanic experiences to induce ASC.

While this use of music falls technically within Schroeder-Sheker's definition of music therapy,[11] it is really quite unique since most medical and therapeutic uses of music therapy are focused more on calming, relaxation, or relatively milder forms of neurological stimulation.[12,13]

Catharsis

Many forms of breath work incorporate insights from Wilhelm Reich, the father of Bioenergetics, who worked extensively with the relationships between vital

energy and emotion. He viewed emotions as raw energy, and encouraged catharsis as a therapeutic process in which patterns of energy that were "stuck" or "frozen" in the body could be liberated, freeing up vital energy for healing and expanded awareness.

Some methods of breath work encourage strong emotional and even physical catharsis. However, it is also possible for milder forms of catharsis to be beneficial. For example, the late Jeru Kabbal developed a method (Quantum Light Breath) whose basic guidelines are drawn from the traditional Buddhist practice known as mindfulness meditation or vipassana. An upright seated posture is taken, the mental focus is maintained on the breath, and evocative music is introduced, sometimes along with guided imagery or suggestion. Breathing is steady, circular, and full, but not forced. Emotional experience is aroused, witnessed, and more subtly allowed to be released.

The availability of such gentler and milder forms of breath work is particularly important for individuals suffering from serious illness or physical limitations in which strong catharsis may not be advisable or practical.

Guidance Through the Process

Varieties of breath work differ in their use of guides or helpers in the process. Holotropic Breathwork is usually done in pairs where one person is lying down as the "breather" while the other is a "sitter." The sitter's main function is to provide a safe holding environment for the breather and not to be actively involved in the breather's experience. On some occasions there is brief use of focused bodywork or physical holding of the breather by trained leaders, but the main emphasis of the technique is the breather's autonomous internal experience.

Other techniques may be used in a group without sitters, and may use more active involvement of a leader in the form of on-going verbal guidance through the process. This can introduce elements of guided imagery, post-hypnotic suggestion, and directing the participant's intentionality to desired outcomes such as physical healing or spiritual awareness.

RATIONALE FOR USE IN MEDICAL ILLNESS

The use of transformational breath work in mind/body medicine is encouraged by findings about the immunological and psychological benefits of emotional expression and arousal.

EMOTIONAL EXPRESSION AND IMMUNITY

The relationship between emotional expression and immunity is an important area of mind/body research. In the Malignant Melanoma Project at the University of California, San Francisco, Lydia Temoshok found emotional expressiveness to be a major prognostic indicator of the course of the disease.[14,15] Further, she observed that the more someone expressed emotion, the lower the mitotic rate of the tumor, the greater the lymphocyte infiltration, and the less the tumor thickness. The implication is that emotional expression may be immunoenhancing, while suppression and repression have the opposite effects.

This line of research helped elucidate the "Type C" coping pattern, of which non-expression of emotion is a central feature.[16] In summarizing her findings on emotion and progression of cancer Temoshok has stated that, whether the emotions are considered pleasant or unpleasant, "If there's a hero in all this, it's probably emotional expression."[17]

Pennebaker et al. found that subjects who intentionally accessed emotional traumas and actively disclosed them through journal writing had significantly improved cellular immunity.[18] Conversely, an experimental study by Esterling *et al.* found emotional repression to be associated with poorer immune system control of a latent herpesvirus (Epstein-Barr).[19]

EMOTIONAL AROUSAL AND IMMUNITY

In other work the deliberate arousal of emotion has been found to be a potential source of immunoenhancement. McClelland and Kirshnit used a documentary film of Mother Teresa to evoke strong positive feelings ("affiliative motiva-

tion") in a group of medical students.[20] They found a significant elevation in S-IgA immediately after viewing the film. S-IgA is the body's first line of defense against pathogens entering through the mouth and nose which produce, among other illnesses, respiratory tract infections (colds, flu, sinusitis, etc.).[21] Individuals with higher concentrations of S-IgA show a more rapid increase in antibodies to antigens, making them less likely to become ill than people with lower levels of S-IgA.[22]

McClelland and Kirshnit's findings are frequently cited as evidence that immunity may be enhanced through positive emotional experience, and other work supports this as well).[23]

Psychological Benefits

To the degree that breath work can encourage emotional arousal, it may contribute to helping patients shift from the repressive, Type C, coping pattern toward greater acknowledgment and expression of their emotional experience. Other potential benefits include a greater sense of self-knowledge, self-esteem, ability to identify and communicate feelings with care providers and loved ones, and empathic understanding. It is our clinical obseva-tion that patients benefit from the release o strong emotion that occurs during breath work whether or not they are able to consciously link the feeling to a specific event in the past.

Risks and Contraindications

The main risks of any form of mind/body medicine are psychological—e.g., inappropriate expectations, disappointment in one's performance or results, or stimulation of intrapsychic conflicts. It is possible that greater awareness and expression of previously repressed emotional material, as may happen with breath work, is not always a good thing, and may lead to abreaction that needs to be addressed with a skilled therapist. Thus, transformational breath work should not take place in a vacuum but with the availability of other supportive therapy.

Physical contraindications depend on the degree of intensity of the form of breath work. For the more vigorous forms which are more likely to arouse strong catharsis (e.g., Holotropic Breathwork), medical judgement needs to be used for patients with cardiovascular problems, lung diseases, posttraumatic and postoperative states, pregnancy, glaucoma and epilepsy. Again, however, there is a wide range of intensities possible in the various forms of breath work, and valuable experiences can be had without requiring extreme hyperventilation or catharsis.

USE IN A CLINICAL PROGRAM

Given the beneficial effects of emotional arousal and expression, it seems reasonable that methods of transformational breath work may contribute to programs of mind/body medicine. Toward that end a method that would be suitable for use in an outpatient group program, attended by people with cancer and their spouses/significant others, was developed by the first author. The method is called Evocative Breath Therapy (EBT).™

The program was that of the Cancer Support and Education Center in Menlo Park, California. It met over ten weeks, one day per week for six hours per day. Group size was generally in the range of five to eight couples. The program included supportive and expressive group therapy, a variety of introspective strategies for finding meaning in the experience of illness, and training in imagery and communication skills. Breath awareness techniques were taught in the context of relaxation training, meditation, pain control, and coping with emotional distress.

Participants were introduced to EBT™ through a discussion of the health benefits of conscious breathing. Conscious breathing was discussed as a way to heighten awareness of emotions, and as a means of releasing emotional and physical tension and pain. It was explained that most of us breathe much more shallowly than we could if we were to enjoy greater energy and well-being. The point was also made that we take a thousand breaths every hour, and the breath is the single most important source of energy that we take in on a moment to moment basis—energy that can be used to fuel the body's healing mechanisms including the immune system.

The instructions for the EBT™ process are quite simple. Participants are asked to sit in an upright posture with spine erect, if possible, and with eyes closed throughout the process. However, if physical limitations prevent the upright posture they are encouraged to find whatever position is comfortable, including lying down if necessary. They are then told to establish and maintain a comfortable pattern of long, full, circular abdominal breaths; and allow any thoughts, feelings, or sensations to be released with the outbreath. The breathing is to be full but relaxed and at a comfortable pace.

Patients are told that if strong emotions arise during the process, it is not necessary to engage them in any way; rather, they should maintain the focus on the breath and simply allow the feelings to pass on their own (much the same as in mindfulness meditation).

TECHNIQUE

The EBT process lasts approximately 60 minutes and is actively guided throughout by suggestion and instruction from the leader. It can be experienced either in groups or individually, and may be employed with the use of an audiotape. There are four stages: entrainment, expansion, reintegration, and completion. Details are as follows:

Stage 1: Entrainment (approximately 15 minutes). Participants are guided to maintain their attention on each breath and establish a pattern of comfortable but full breathing as described above. This phase is augmented with slow, peaceful, relaxing background music chosen for its hypnagogic effects.

Participants are reminded that if emotions arise at any point during the process, to not try to analyze or engage them in any way, but simply notice them, allow them to pass, and return the focus of attention back to the breath.

Stage 2: Expansion (approximately 25 minutes). Participants continue breathing as fully as they comfortably can without straining themselves, while maintaining a pattern of full, circular abdominal breaths. They are reminded to not "do" anything such as force their breathing or "make anything happen," nor are they to breathe in any way that causes physical discomfort. If physical

discomfort occurs they are reminded to adjust their body or their breathing in any way necessary to alleviate the discomfort.

During this phase a sequence of increasingly evocative music is introduced. Pieces are selected from a range of sources (classical, movie soundtrack, chanting, religious) based on their ability to evoke emotion. The combination of the music and the breathing itself helps to build a charge of vital energy, increase tidal volume and further intensify the flow of emotional energy through the body-mind continuum.

A variety of images are suggested, such as: "Imagine that you are inhaling the energy of the music with each in-breath. . . . Imagine that life is breathing itself into you, that existence is breathing you. . . . Imagine that you are making more space inside for life with each breath, inviting life in. . . . Imagine that your body has the wisdom to feel whatever needs to be felt, and to release anything that needs to be released, even if you don't understand. . . ." and "Imagine that your body knows how to use this energy for your healing. . . ."

Symbolically this part of the process corresponds with "opening up," releasing what has been held in and making oneself more spacious inside.

This phase builds to a plateau of arousal with several pieces of music which could be described as ecstatic, inspirational or expansive (e.g., Bach's *Cantata No. 147*, or a bagpipe rendition of *Amazing Grace*). Verbal guidance continues to reinforce the focus on the breath.

Stage 3: Reintegration (approximately 10 minutes). The character of the music shifts back toward peaceful relaxation in order to encourage a feeling of peace and re-integration. Paradoxically, while participants' vital energy remains aroused to a high level for some time, they may simultaneously experience a state of deep calm and relaxation.

Within this continuing state of expanded consciousness they are guided by specific suggestions for introspection. Suggestions might include reflecting upon their relationship with their bodies, asking their innate wisdom what is needed for their healing, reflecting upon their relationship with the Spritual or

Absolute, or reviewing their deepest values in life. It is during this phase that participants commonly experience breakthroughs in self-awareness, insights into their medical condition, and existential or spiritual insights.

Stage 4: Completion (approximately 10 minutes). Participants are invited to slowly open their eyes, slowly orient themselves and, while remaining in silence, form a dyad with a partner (not necessarily the spouse). Quiet music continues in the background. The partners in the dyad sit facing each other. The leader reminds them to remain aware of their breathing, and may then lead them through a brief exchange of empathic communication about feelings or insights from the experience. This encounter process often yields expression of strong inner feelings of gratitude, appreciation, love or joy.

After the completion phase the group may disperse or may break before other activity. Participants are cautioned to refrain from driving until they are sure they have fully returned to a normal state of consciousness. They are also encouraged to be as quiet and peaceful as possible for the remainder of the day.

IMPACT ON SALIVARY IGA: A PILOT STUDY

A pilot study of the effects of this technique on S-IgA was conducted with data from a sequence of several groups of program participants. The EBT™ sessions were all led by the first author (WC). All were conducted in the same room with the same equipment, same music, and same procedure.

Since the study examined an intervention that occurred routinely within an established program, rather than a purely experimental one, the protocol needed to be non-invasive—not only to the subjects but also to the process of the program itself. This imposed limitations on the research design over what might be considered optimal in other circumstances. For example, saliva samples were taken only pre- and immediately post-intervention and none was taken later, as might be desirable to establish how quickly S-IgA levels would return toward baseline. Also no data collection took place to measure changes in emotional state or other psychosocial variables.

SAMPLE

A heterogeneous sample of forty-five adults (31 females, 14 males) participated in the study. This included 22 healthy support persons (spouses, family members, support staff), 21 cancer patients with a variety types and stages of cancer (breast–8, lymphoma–3, lung–2, pancreatic–2, ovarian–2, colon–2, multiple myeloma–1, brain–1); and two patients with other illnesses (Huntington's Chorea and Parkinson's Syndrome). Subjects served as their own controls.

PROCEDURE

Subjects deposited 2-3 ml of unstimulated whole saliva into a capped polypropylene test tube (12mm x 75mm, 6ml capacity) immediately before and after the group EBT^{TM} sessions. The samples were immediately packed in dry ice and taken to an independent immunology lab for assay.

ASSESSING IGA IN SALIVA

Polyclonal goat anti-human IgA antibody (Pierce, Rockford, IL) was coated overnight at 4°C onto 96-well plates at 1µg/ml in 0.02 M carbonate buffer, pH = 9.6. Additions of 100µl were made except for the blocking step. Plates were washed with PBS and Tween 20 between 1 hour incubations. Non-specific binding was blocked by incubation with 200µl PBS-Tween + 1% BSA.

Human saliva was centrifuged at 2000 Xg for five minutes and titered 1:2 down the plate starting at a 1:400 dilution. After a 1 hour incubation with horseradish peroxidase conjugated goat anti-IgA antibody (Pierce, Rockford, IL), ABTS (2,2'-azino-di[3-ethyl-benz-thiazoline-6-sulfonate]) substrate solution (KPL, Gaithersburg, MD) was added.

Optical density was read on an automated plate reader (Molecular Devices, Santa Clara, CA) and results were calculated using Δ Soft analysis software (BioMetallics, Princeton, NJ). IgA concentration was determined using a 4 parameter curve fit based on a titration curve generated with IgA standard (Chemicon, Temecula, CA) that was added starting at 16µg/ml.

RESULTS

Pre- and post-intervention mean levels of S-IgA concentration were compared (Table I). A 46.3% increase in mean S-IgA concentration was found (839 µg/ml, $T = 2.611$, $df = 44$, $p = 0.0123$). Thirty-five subjects increased and ten decreased. Statistical regression toward the mean was clearly operative in those who decreased, in that they had the highest pre-intervention levels. There were no significant differences between the subgroups by cancer status, and both cancer patients and the other subjects showed statistically reliable increases in mean S-IgA concentration (Table II).

Optimal data analysis was used to derive a mathematical model based on the data. This methodology is used to discover decision rules, known as optimal

Table I

Change in S-IgA Concentration (µg/ml): Paired Differences T-Test (N = 45)

	Means	SD	*t*	*p* <
Pre-intervention	1929	1672	2.61	0.05
Post intervention	2769	2094		

Table II

Change in S-IgA Concentration (µg/ml): Cancer Patients vs. Others, Independent Groups T-Test

		Cancer N = 21	Others N = 24	*t*	*p* <
Pre-intervention	Mean	1956	1906	0.10	0.93
	SD	2198	1069		
Post intervention	Mean	2768	2769	0.0	0.99
	SD	1378	2596		

classification functions, that achieve the theoretical maximum level of classification accuracy when used to predict the actual class membership of the observations in a given data sample.[24]

The resulting model predicted that S-IgA values below 2269.5 μg/ml were pre-test and those higher were post-test. This cut-point for distinguishing pre and post values was statistically significant (after 4460 Monte Carlo experiments, $p < 0.0367$, confidence for $p < 0.05 = 99.99\%$).

The model correctly classified 73.33% of the pre-test scores and 53.33% of the post-test scores for a mean sensitivity across classes of 63.33%. The effect strength was moderate, 0.278 (on a scale of 0 to 1), which is comparable to that of other interventions in behavioral medicine.

Leave-one-out analysis (LOO) was also applied to the data. LOO allows a determination of whether the findings were idiosyncratic to the sample or are likely to be generalizeable to an independent random sample. LOO found that the effect strength decreased only marginally, suggesting generalizeability of the model.

Discussion

Given the limitations of the design this study is best seen as a pilot to help in formulating future research questions and designing a more complete study, including measurement of psychosocial variables associated with effects of the technique.

The design does not address whether the results were due to one particular aspect of the intervention such as the breathing, music, imagery, or qualities of the leader; or the synergistic effects of its integrated components. It also does not address how long the effect may last. We speculate that the immunologic effects are probably transitory and that subjects would return toward baseline levels within perhaps an hour, as has been the result in other intervention studies observing changes in S-IgA.[17,22-24]

Could the results simply be effects of aerobic exercise? This is possible, but in two studies of the effects of aerobic exercise (treadmill and running) on S-IgA, McDowell et al.[25,26] found a temporary *reduction*, and in a third study[27] found no effect.

The subjective experiences of the participants may be more important than any immunologic effects. Patients consistently report dramatic reduction in pain or discomfort after the experience. They also report a strong sense of emotional release, lightness, sometimes elation and, in general, emotional well-being.

It is not uncommon for patients to report profound experiences or insights. For example, patients have stated, "I feel my heart has opened and is coming out through my eyes," "I was never able to feel love for myself until now," "I have never felt so alive before," and "This is the first time I have ever been able to cry without feeling ashamed." They also report experiencing a sense of unity or connectedness with something greater than themselves.

These reports are consistent with the experience of an ASC. As explained by Lawlis,[7] an altered state "appears to work through a process of destructuring and restructuring the mental and emotional framework of one's world. . . . (I)t can provide the opportunity for de-automatization, the undoing of the habitual patterns. . . . Cognition is inhibited in favor of perception, and the active intellectual style is replaced by a receptive mode."[7(p.93)]

It is possible that the technique may have enduring effects on consciousness over time, particularly in people who practice it regularly. Several who have used the method as a daily practice via audiotape over many months report cumulative benefits in their sense of emotional well-being. This is consistent with results of a controlled study of repeated use of Holotropic Breathwork over several weeks, in which Holmes *et al.* found significant increases in self-esteem and reductions in death anxiety.[28]

In explaining the emotional impact, we theorize that a charge of energy is built up in the body by full, abdominal breathing. This altered energetic state induces an altered state of consciousness in which the ego defenses that normally prevent the awareness and release of emotion are bypassed. Body memories are re-stimulated and then released through the breathing process. The on-going post-hypnotic suggestion of the leader invites a continuing acceptance of the person's emotional experience, greater self-acceptance, greater appreciation for life, and an attitude of trusting the wisdom of the body.

We further speculate that with the release of emotional blockages and holding patterns in the physical body, the proper flow patterns of vital energy are restored. This in turn may allow a change in patterns of physical symptoms

and make more vital energy available to fuel the body's healing mechanisms, including the immune system.

CONCLUSION

The data reported here suggest that the method studied may have a beneficial impact on immune system parameters. Questions for future research include: How long does the elevation in S-IgA last? Is it associated with any other changes in immune functioning? Are the effects clinically significant? What aspects of breath work contribute most to immunoenhancement? How often would it need to be practiced to achieve clinical benefits? What variables predict who would benefit most? And, what are the psychological outcomes?

To answer these questions would obviously require other research designs. The most basic would be a randomized trial comparing outcomes of EBT™ with a non-intervention control sample, and collecting data on psychosocial and other physiologic variables. Other worthwhile efforts would be to compare EBT™ with its component elements, such as listening to evocative music alone, or breathing without music—guided and unguided. Finally it would be useful to compare outcomes with those of other mind/body and energetic interventions such as the relaxation response, meditation, imagery, internal chi kung, or Therapeutic Touch.

Based on the reports of patients and the suggestion of immunoenhancing effects, breath work techniques warrant further study as a possible contribution to the repertoires of mind/body and energy medicine.

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