

Clarifying the use of Basal Body Temperature Charting in Traditional Chinese Medical Clinical Practice

Abstract

Basal body temperature (BBT) charting is frequently employed in the holistic treatment of infertility. However, the use of BBT for fertility prediction is limited by accuracy and interpretation. Given its limits, should practitioners still recommend patients use BBT charting when trying to attain pregnancy? In this article we present ways of using BBT charting to improve clinical performance by identifying diagnostic patterns within the framework of traditional Chinese medicine (TCM). Additionally, this paper explores and analyses the correlations between TCM yin/yang theory, BBT and functional sex hormones across the menstrual cycle, and identifies the ideal cycle conditions for conception.

I. Introduction

Basal body temperature (BBT) charting has traditionally been used in natural family planning as a contraceptive tool. For several decades, there has been a renewed interest in BBT charting as an aid to successfully achieving pregnancy, specifically for identifying ovulation and the fertile window for conception. For many practitioners who offer natural fertility enhancement, BBT charting has become ubiquitous (Fehring et. al., 2001). However, most research finds that BBT charting is insufficient for accurately identifying ovulation and the fertile window. Notably, when compared to other markers for ovulation, including cervical mucus observation, salivary ferning and urinary luteinising hormone testing, BBT was found to be the least accurate method for determining ovulation (Guida et al., 1999). BBT charting also suffers from some important limitations including: 1) the accuracy of information collected and charted, 2) differences among practitioners in the interpretation of data, and, 3) it identifies ovulation retrospectively (after it occurs), while the window for conception primarily predates ovulation (Baron & Fehring, 2005).

Given its limits as a tool for ovulation prediction, does BBT charting still have a place in the modern practice of traditional Chinese medicine (TCM) for the treatment of infertility? We argue that with proper interpretation, BBT charting provides an indispensable diagnostic tool that complements the practice of TCM and is deeply resonant with its traditional theoretical and diagnostic structures.

II. Understanding BBT within the framework of TCM

Using BBT as a diagnostic tool is a novel application of the diagnostic paradigm of TCM. It is a modern approach that augments pattern differentiation beyond the typical methods of zang fu, tongue and pulse diagnosis. It allows us to extrapolate beyond these traditional diagnostic tools and gain better insight into the patient's condition as well as a deeper understanding of TCM.

After many years of treating infertility patients, and having analysed the BBTs of over 7,000 women, we began to see that common diagnostic patterns such as yin deficiency, yin deficiency heat, yang deficiency, qi deficiency and qi stagnation were obvious in the presentation of the BBT, often with a higher degree of accuracy than the subjective reporting of symptoms by the patient. In an effort to test this theory, we reviewed over 250,000 BBT charts from Fertility Friend (www.fertilityfriend.com) that were correlated with the patient's allopathic diagnosis. Although this was an informal review, we were able to identify several other correlations that related to the effects of temperature on follicle stimulating hormone (FSH), estradiol (E2), cervical discharge and progesterone (P4). We then used this data to identify the relationship between yin and yang and the sex hormones.

III. Yin, yang and the sex hormones

The pattern evident within the ideal BBT chart represents the elegant yin/yang interplay of female sex hormones throughout the menstrual cycle. For TCM

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practitioners, a thorough understanding of the interplay of yin and yang as reflected by hormonal thermodynamics can help elucidate pattern differentiation, diagnosis and the efficacy of treatment.

The pattern evident within the ideal BBT chart represents the elegant yin/yang interplay of female sex hormones throughout the menstrual cycle.

The theory of yin and yang is pervasively evident within the menstrual cycle. The complete menstrual cycle can be split into two aspects: a yin follicular phase and a yang luteal phase. The follicular phase is ruled by yin and blood and is characterised by relatively cooler body temperature, the production of fluids (cervical, follicular), and the development and nourishment of the ovum. The luteal phase, on the other hand, is ruled by qi and yang and is characterised by a rapid rise to higher temperatures, the release and transportation of the ovum, and if conception occurs, fertilisation and the implantation of the embryo. Most students of TCM gynaecology understand this basic dichotomy, but each phase can also be usefully further divided into yin and yang aspects.

The follicular phase

The opposition of hormones in the follicular phase demonstrates the elegant interplay of yin and yang. As FSH is produced in the anterior pituitary it induces follicular development. As the follicle matures, it produces E2, which down-regulates the production of FSH, creating a negative feedback loop, or as we might understand it, yin controlling yang.

Our clinical observations show that women with elevated levels of FSH consistently exhibit higher BBTs in the follicular phase. This finding is supported by BBT elevation in patients that use oestrogen antagonists such as clomiphene and letrozole (Femara). We have found the elevation of temperature for these patients correlates with yin deficiency or heat symptoms and is time and dose dependent; that is, the higher the dose and the longer the drug is used is correlated with greater elevation of follicular phase temperatures as well as more severe heat symptoms.

Estradiol also demonstrates its yin characteristics through the production of cervical fluid and oocyte maintenance. Patients with high levels of FSH who exhibited warmer BBTs in the follicular phase were also found to have scanty or insufficient fertile cervical fluid and produced oocytes that saw higher levels of fracturing during IVF procedures. We might think of this as yang injuring the yin.

While irregular temperatures frequently indicate abnormal hormone levels, it is important to note that normal BBTs do not necessarily mean that hormone

levels are within normal limits. For instance, we observed that patients with elevated levels of both FSH and E2 maintained normal BBTs (due to equal, but excessive, cooling and warming effects).

The luteal phase

The luteal phase begins at ovulation, when rising levels of E2 trigger a surge in luteinising hormone (LH). This LH surge has long been associated with a nadir (low point) in BBTs, characterising it as extremely yin in nature. Luteinising hormone is responsible for the final maturation of the follicle, and for instigating ovulation and progesterone production. Shortly after the nadir, temperatures rise rapidly, by up to one degree Fahrenheit, as yin transforms into yang. Progesterone, produced in what is now the corpus luteum, is primarily responsible for this rise in temperature. After ovulation, growth and metabolic activity in the corpus luteum increase dramatically, with oxygen requirements exceeding that of the heart, liver or kidneys, requiring a marked increase in capillarisation (Niswender et al., 2000). As body temperature rises, the heart rate also increases, which may serve to further increase blood flow to the corpus luteum and increase progesterone production through a temperature-dependent positive feedback loop. In our clinical experience, women who did not achieve an average temperature of over 98.0 degrees Fahrenheit (36.7 degrees Celsius) during the luteal phase had insufficient progesterone production and an increased likelihood of early miscarriage.

In addition to its general warming effect on the body, the yang aspect of progesterone is illustrated in its inhibition of E2, which declines as progesterone production increases. This decreases the contractile action of E2 and helps stabilise the uterine lining for implantation. It should also be noted that the increase in blood flow associated with elevated temperatures in the luteal phase may help further envasculate the uterine lining.

For the TCM practitioner, understanding the basic yin and yang relationships between the sex hormones can inform diagnosis and treatment. In our practice, we have found this to be an invaluable diagnostic tool when reviewing patient BBT charts.

IV. The application of pattern differentiation outside traditional constructs

The key to the effective treatment of female infertility is absolute precision in diagnostic paradigms and treatment plans. Examining BBT charts allows the experienced clinician to see the interplay of qi, blood, yin, yang and stagnation very clearly. This information is used diagnostically and prescriptively, and can also be used to measure the efficacy of our treatments.

Based on our clinical experience, we have found that certain BBT patterns were highly correlated with cycles in which patients successfully achieved pregnancy. When

patients' BBTs started to resemble this pattern, the patients had the highest likelihood of conceiving. We detail this ideal pattern below, which we have termed the 'conceivable cycle'. We also noted that certain BBT patterns were highly correlated with traditional Chinese medicine patterns of disharmony and common allopathic pathologies. Four of these common patterns of disharmony are also presented below.

V. The ideal BBT chart

The ideal BBT chart represents the biphasic temperature pattern necessary for optimal fertility (see Figure 1).

We found that when the BBT closely matched these parameters the patient's cycles would be highly regulated and the likelihood of conception significantly increased. The conceivable cycle is represented by the following menstrual parameters: a regularly occurring 28-day cycle, ovulation on cycle day 14 with concurrent clear, stretchy and abundant cervical discharge, no premenstrual symptoms, four days of menstrual bleeding which soak a tampon or pad every four hours with fresh red blood and without clotting, spotting or cramping.

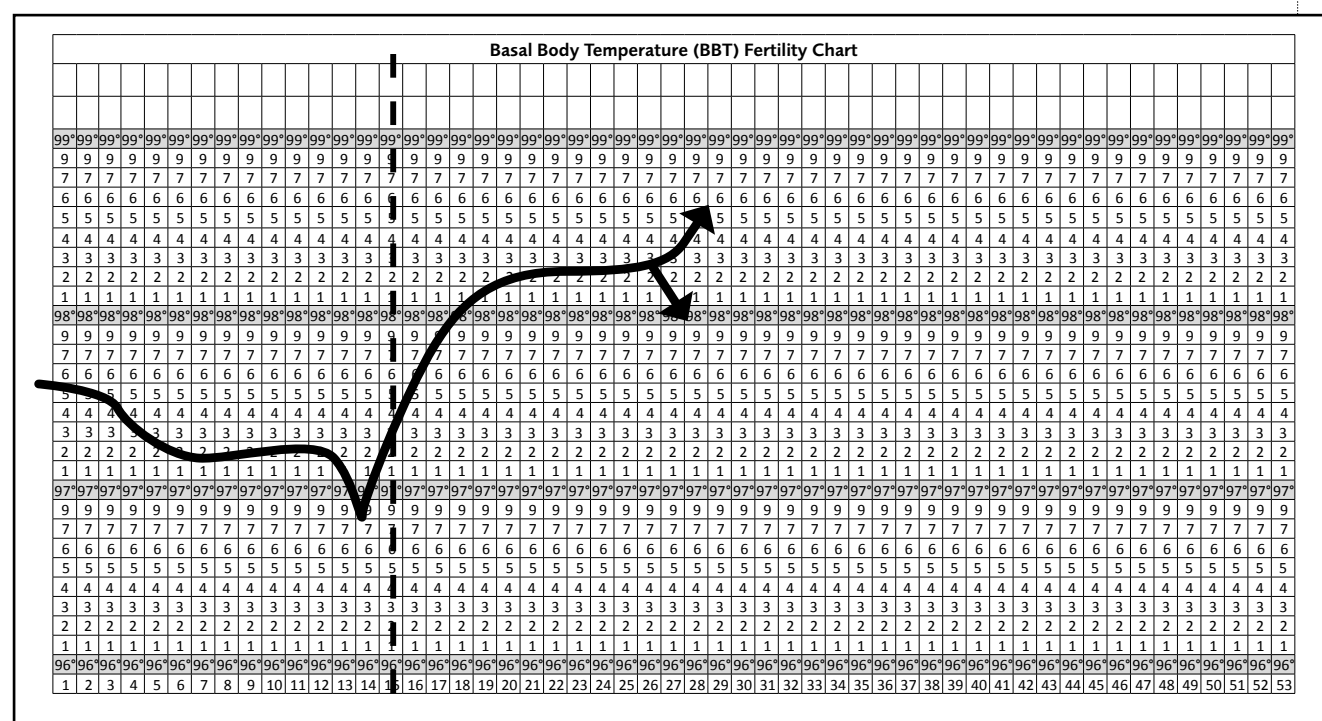


Figure 1: The ideal BBT chart

The ideal bleeding phase

In our research the temperatures during the bleeding phase did not seem to affect fertility outcomes and could often be slightly elevated without any pathological correlation. While most women will have some degree of blood stasis, which requires regulation in order to facilitate conception, this pathology does not typically impact the BBT.

The ideal follicular phase

In the follicular phase, temperatures should average 97.2 degrees Fahrenheit (36.2 degrees Celsius). We found that when the temperatures averaged 97.2 degrees Fahrenheit across the follicular phase, ovulation would be well-timed, cervical discharge would be abundant, stretchy, clear and timed with ovulation, FSH and E2 levels would be within acceptable ranges and follicular fracturing rate during inseminations would be low. When the temperatures

were below 97.2 degrees, we noticed increased time to ovulation (cycle days 16 to 18) and excessive cervical discharge (occurring outside of the fertile window).

The ideal luteal phase

The ideal luteal phase has temperatures that average at or above 98.2 degrees Fahrenheit (36.8 degrees Celsius) from three days after the occurrence of ovulation. When the luteal phase temperatures were consistently above this temperature in the months prior to conception, patients were increasingly likely to have normal progesterone levels, and significantly lower miscarriage rates (approximately five per cent).

VI. Pathological BBT patterns

Variation from the ideal pattern described above often indicates pathology, although not always. As with all patient

reported data, inaccuracy in recording and reporting data should always be accounted for. Variation in sleep habits, alcohol consumption, stress, travel and the time at which a patient takes her BBT may influence the data a practitioner receives. While the general pattern of the BBT chart is most strongly influenced by the primary sex hormones, thyroid hormone levels may also influence the temperature as a whole; typically, a hypothyroid chart will resemble a yang deficient pattern, with temperatures averaging well below 98.0 degrees Fahrenheit in the luteal phase.

Yin deficiency with heat

When the average temperatures exceeded 97.2 degrees Fahrenheit across the follicular phase, ovulation was typically early, cervical discharge was scanty or absent and poorly timed with ovulation, FSH was elevated and E2 levels were lower (Fig. 4). The severity of these presentations correlated with the degree of temperature elevation. With higher temperatures we also noticed an increase in fractorisation during IVF cycles, as well as an increased incidence of yin deficiency heat signs such as night sweats, hot flashes, dryness, irritability and insomnia.

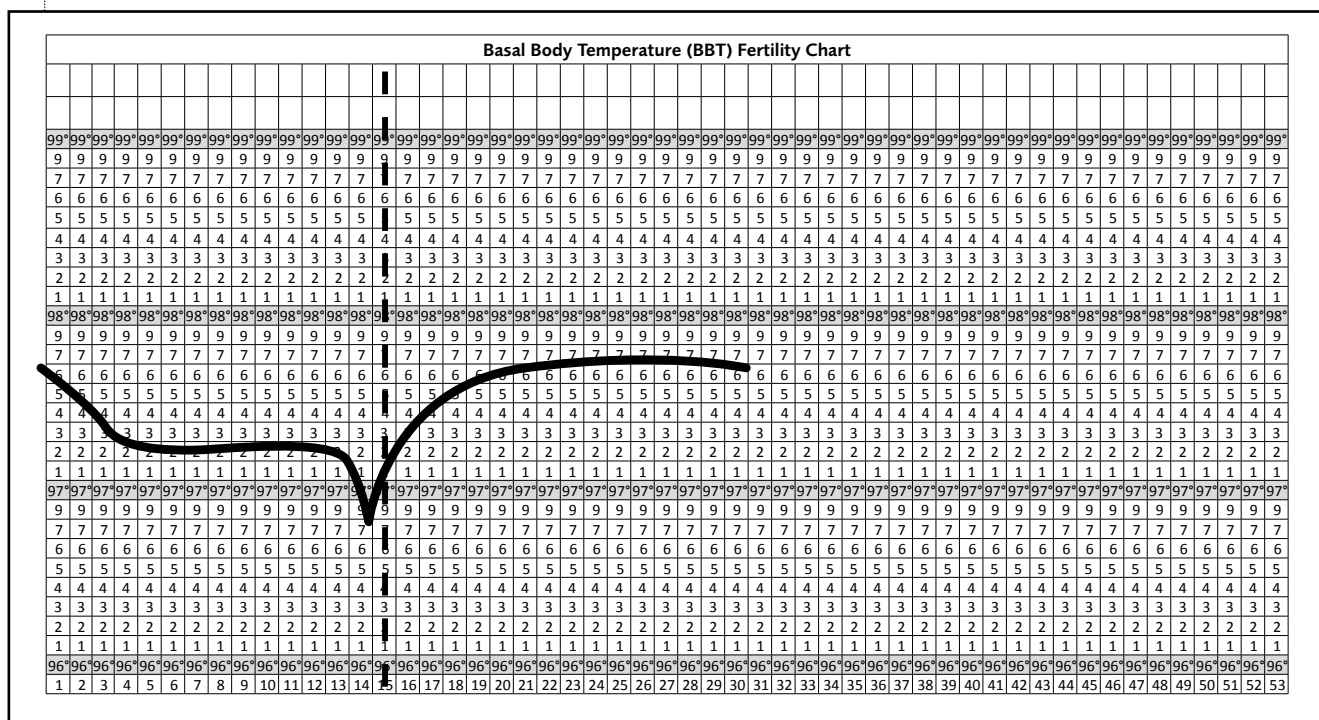


Figure 2: Yang deficiency

Yang or qi deficiency

When the average follicular phase temperatures were below 98.0 degrees Fahrenheit in the months prior to conception, we observed a significantly higher incidence of miscarriage (approximately 40 per cent). Progesterone levels correlate closely with BBT. When the luteal phase temperatures average 98.0 degrees Fahrenheit, progesterone levels will correspondingly average around 20 ng/ml. Although qi and yang are grouped here as pathological patterns because the chart looks similar, careful differentiation is required to ascertain the correct pattern diagnosis (see Fig. 2).

Anovulation

An anovulatory cycle will not be distinctly biphasic (see Fig. 3). It will typically present as a highly irregular saw-tooth pattern of peaks and valleys. This chart demonstrates the liver's inability to metabolise the endogenous

hormones and the resulting Liver qi stagnation. This pattern is very common in women with polycystic ovarian syndrome (PCOS). Too often clinicians assume that PCOS with anovulation should be addressed by tonifying the Spleen and resolving dampness, which will only work occasionally. Based on the authors' experience, clearing the qi stagnation first and then proceeding to address the constitutional issues will produce substantially more effective results.

Qi stagnation

Qi stagnation is easily observed from the BBT. It is characterised by a highly irregular pattern of saw-toothed peaks and valleys (see Fig. 5). Unlike anovulation, this chart will typically be biphasic. Qi stagnation may appear in both the follicular and luteal phase, and can be treated across the menstrual cycle.

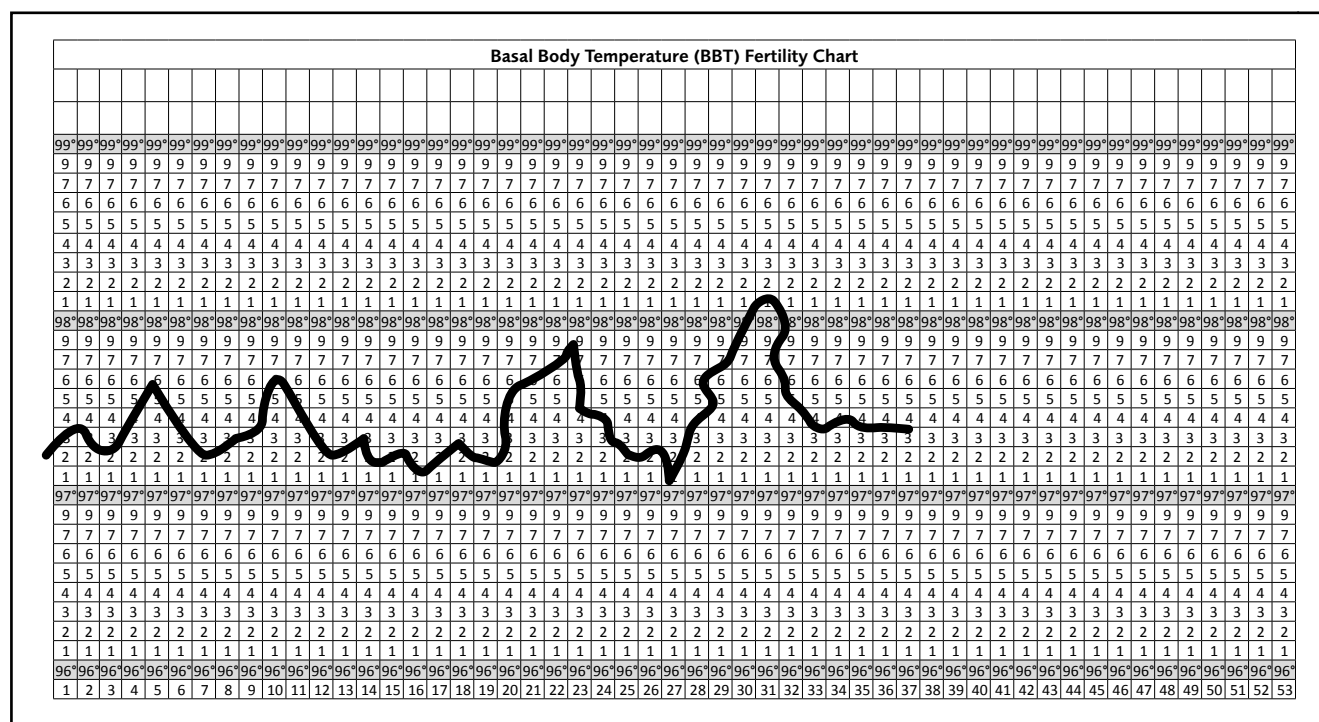


Figure 3: Anovulation

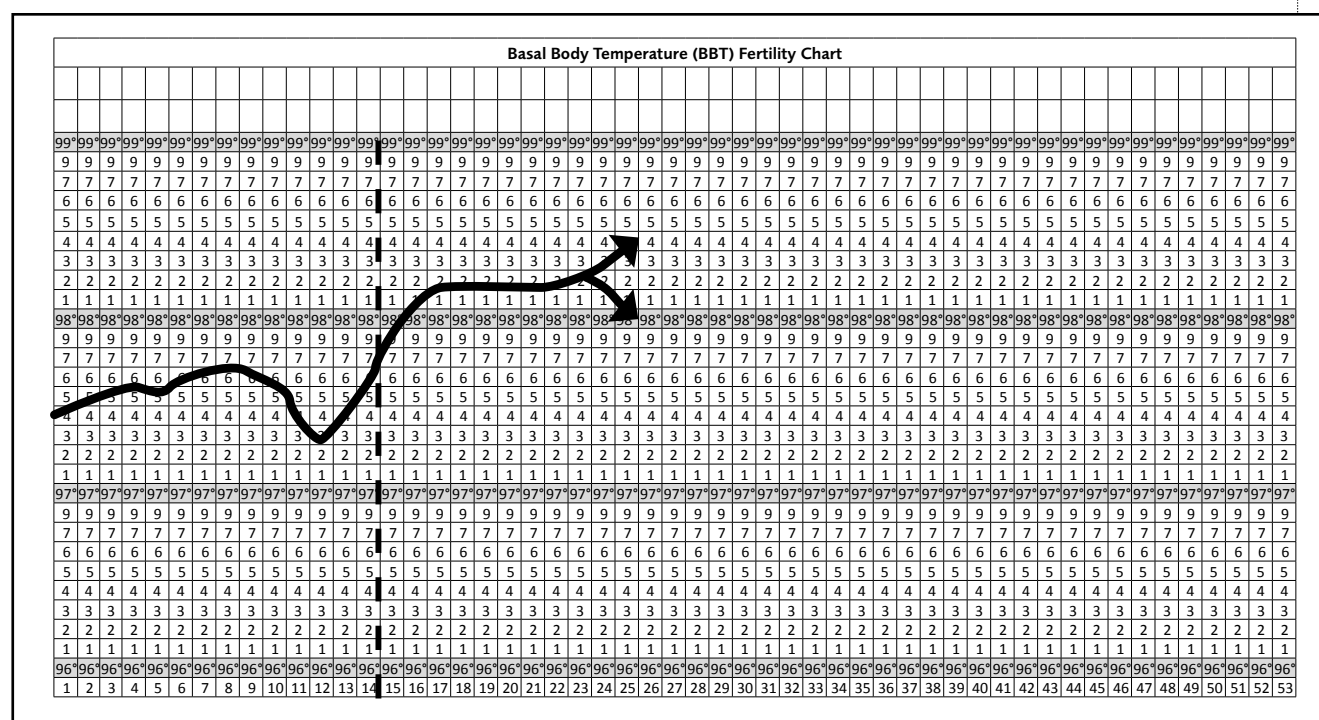
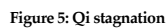


Figure 4: Yin deficiency with heat



There is tremendous misinformation on instructions for BBT charting. Patients should take their temperatures upon waking before getting out of bed with a digital thermometer to the nearest tenth of a degree. Additionally, they should record the quality and quantity of cervical

discharge. Waking up at an unusual time, drinking alcohol the night before, becoming overheated in the night or illness can all significantly impact on the accuracy of the reading — any such deviations should be noted on the chart.

Patients have reported experiencing distress over the process of taking their temperature daily. This is often because they do not understand or are disappointed with their temperatures. Reviewing the BBT chart with your patient can be an opportunity to help them see progress they had not previously noticed. Even the smallest amount of progress highlighted by the clinician can be extremely valuable for the patient's confidence in both herself and the clinician's ability to help her.

X. Conclusion

While BBT has limited application in the prediction of ovulation and the fertile window, especially given the increasing accessibility and accuracy of technologically advanced methods of identifying the ovulatory window, it remains a useful tool for the TCM practitioner. Understanding BBT as a function not only of sex hormones but also of yin and yang can inform the diagnostic process, leading to more precise assessment and intervention. The interpretation of BBT in this way also provides the practitioner with a useful link between the diagnostic paradigms of conventional medicine and TCM. Although this paper has shown the usefulness of this approach in a clinical setting, scientific evidence for its effectiveness is still limited. Further studies are needed in order to further document the link between sex hormones and BBT, and to evaluate protocols for effective treatment of complex disorders like infertility.

Kirsten Karchmer is a Board Certified reproductive acupuncturist and former President of the American Board of Oriental Reproductive Medicine. She pioneered proprietary infertility assessment and treatment protocols that optimise fertility while improving the overall health of the patient. She is also the CEO/founder of *Conceivable*, a technology-enabled fertility solution at 1/100 the cost of IVE, and *Viv Wellness*, a woman's health revolution committed to eradicating PMS and cramping. In 2013, Kirsten translated her successful clinical programmes into her technology-enabled platform that uses machine learning/AI to provide affordable and impactful reproductive solutions. *Conceivable* was named one of the most innovative health tech start-ups from MedTech in 2015, and has been featured in *The New York Magazine*, *Tech Crunch*, *Huffington Post*, and *MHealth*. Kirsten lectures internationally on women's health, the future of integrative medicine and using technology to better serve patients, providers and healthcare systems. She has been recognised as one of the top female start-up founders to watch, is the recipient of the Texas Trailblazer Award for her innovation in healthcare, and is a *Huffington Post* contributor.

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