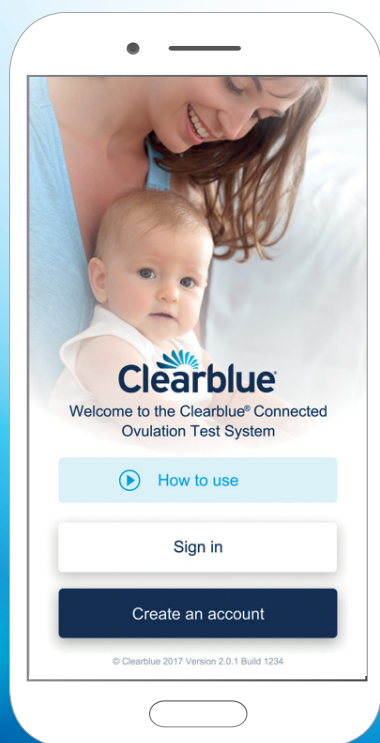


# Clearblue<sup>®</sup>

## CONNECTED Ovulation Test System

Proven to **double** the chances of  
**getting pregnant**<sup>1,a</sup>



Professional Series  
Ovulation

<sup>a</sup> In the first cycle of use, vs not using ovulation tests.



# About Clearblue®

Clearblue® is the world's #1 selling brand in home pregnancy and fertility tests.<sup>b</sup> Consumers trust the Clearblue® brand because it delivers the accurate information they want. The Clearblue® product range is built on a strong foundation of peer-reviewed science and consumer understanding. Clearblue® products are also trusted and recommended by doctors,<sup>c</sup> many of whom recognize that Clearblue® is supported by over 30 years of expertise, quality, and innovation in consumer diagnostics.

If you are a healthcare professional and wish to contact a member of the Clearblue® support team about any product in the Clearblue® range, please send an email to [spdproductsupport@spdspark.com](mailto:spdproductsupport@spdspark.com)

## Ovulation

### Clearblue® Connected Ovulation Test System

Proven to **double** the chances of getting pregnant<sup>1,a</sup>



The Clearblue® Connected Ovulation Test System is the first and only dual-hormone ovulation test able to connect to a phone. It combines a unique system that tracks two key fertility hormones with the convenience of an app, providing women with the accuracy of an ovulation test on their phone, and proven to double the chance of conception.<sup>1,a</sup>

Features of the Clearblue® Connected Ovulation Test System:

- The ability to detect estrone-3-glucuronide (E3G), a principal urinary metabolite of estradiol<sup>2</sup> (rising levels of which are indicative of the onset of the fertile window),<sup>3</sup> and luteinizing hormone (LH) (a surge of which precedes ovulation)<sup>3,4</sup>
- Clearblue's most advanced ovulation test – over 99% accurate at detecting the LH surge<sup>5</sup> – now with phone connectivity



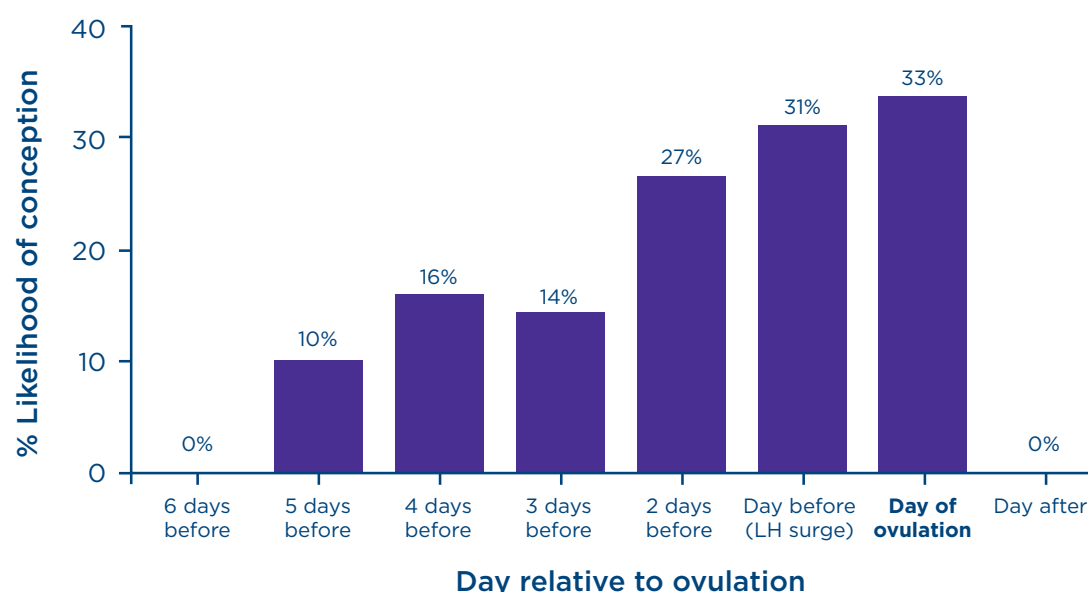
- Accurately adapts to a woman's personal menstrual cycle – in a study of 87 women, 4 or more fertile days were identified in 80% of cycles using actual cycle length<sup>6,7</sup>
- Technology which synchronizes test results to the app, when **Bluetooth®** is enabled
- Smart personalized reminders, based on fertility data
- The ability to enter information such as cycle length, bleeding, spotting, and dates of intercourse
- Cycle comparison to enable easy tracking of fertility data and to facilitate discussion with healthcare professionals

## The fertile window

There are only a limited number of days in each cycle when a woman can conceive, referred to as the fertile window. The duration of the fertile window is determined by the lifespan of the ovum and the viability of sperm in the days preceding ovulation. It is generally accepted that sperm can survive for up to 5 days in sperm-supportive mucus, and ova typically survive for 12–24 hours after ovulation.<sup>8–10</sup>

The fertile window lasts for around 6 days, starting from approximately 5 days preceding ovulation until the day of ovulation (Figure One),<sup>10</sup> and further studies have confirmed that timing intercourse to coincide with the fertile window increases a woman's chance of conceiving (Figure One).<sup>11,12</sup>

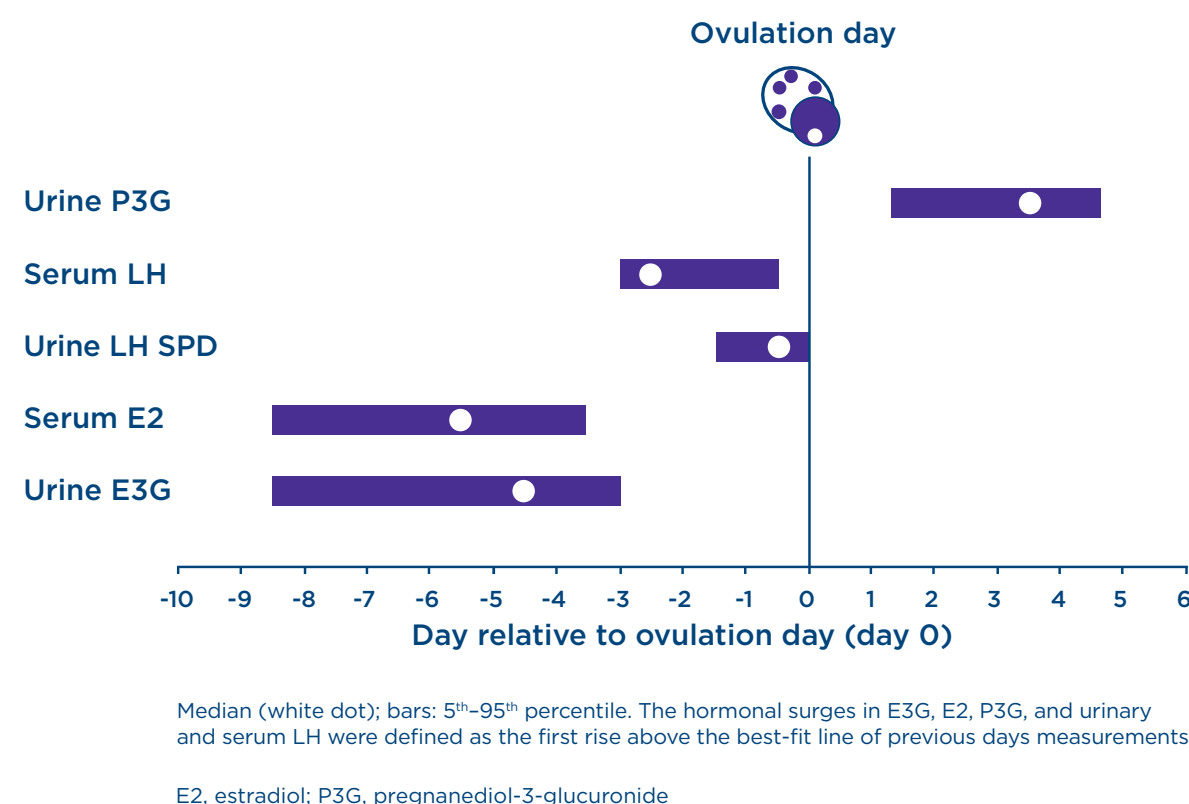
**Figure One: Estimated likelihood of conception from intercourse on days of the menstrual cycle relative to the day of ovulation. Adapted from data by Wilcox AJ, et al (1995).<sup>10</sup> A study of 221 women who had a single act of intercourse in their cycle**



## Accuracy of urinary hormones for detection of the fertile window

The levels of a number of serum and urinary hormones have been observed to rise and fall in relation to ovulation (Figure Two). The hormone estradiol is the major physiological determinant of the onset of the fertile window. Levels rise during the cycle, stimulating the secretion of sperm-supportive cervical mucus and triggering a surge in LH once levels reach a threshold (Figure Two).<sup>3,4,13</sup> Levels of the principal urinary estradiol metabolite, E3G,<sup>2</sup> are observed to rise in urine substantially from ~3 days prior to ovulation until up to 5 days post-ovulation.<sup>3,4</sup> The LH surge, occurring 3 to 4 days after the E3G rise, then causes the dominant follicle to rupture and release a mature ovum. The urinary LH surge is the most reliable indicator of impending ovulation, as ovulation typically occurs ~24 hours later and does not occur in its absence.<sup>3,4,14</sup> Peak levels of LH do not always precede ovulation and thus cannot be used as a prospective marker for ovulation.<sup>3,4,14</sup> Progesterone is observed to rise after ovulation and serves to both confirm ovulation and mark the end of the fertile window.<sup>3,4</sup>

**Figure Two: Reproductive hormone surges in relation to objective ovulation<sup>3</sup>**

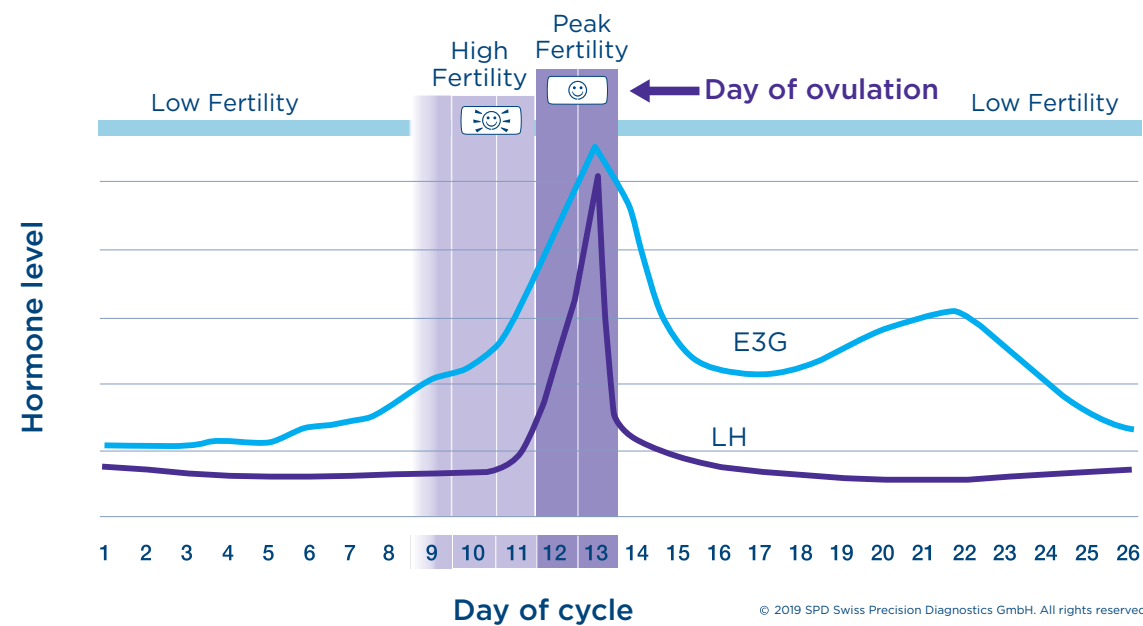


# The Clearblue® Connected Ovulation Test System is highly accurate in detecting the fertile window

The Clearblue® Connected Ovulation Test System utilizes disposable urinary ovulation test sticks to detect E3G and LH. Using Bluetooth® technology, this information is synchronized with the Clearblue® Connected Ovulation Test System app<sup>d</sup> to provide women with accurate, scientifically based, personalized tracking with alerts of their fertile days (both High and Peak).

The Clearblue® Connected Ovulation Test System is over 99% accurate at detecting the LH surge<sup>5</sup> and adapts to a woman's personal menstrual cycle to typically identify 4 or more fertile days (Figure Three)<sup>6</sup> – providing the user with more opportunities to plan intercourse and increase her chances of becoming pregnant sooner.<sup>12,15,e</sup>

Figure Three: Example of typical levels of E3G and LH during a menstrual cycle, and days of High and Peak Fertility detected by the Clearblue® Connected Ovulation Test System



Each woman's cycles are unique and hormone levels differ; therefore, the number of fertile days identified can differ between women and between cycles. In a study of 87 women, the following was observed:<sup>6,7</sup>

| Number of days of High Fertility before Peak Fertility | Percentage of women* |
|--|----------------------|
| 0-4  | 66%                  |
| 5-9  | 25%                  |
| 10+  | 1%                   |

\*In 8% of women, no days of Peak Fertility were detected after days of High Fertility.

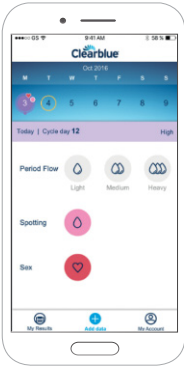
# Features of the Clearblue® Connected Ovulation Test System



Personalized alerts notify the user of appropriate days to use urinary testing sticks.



Connects to the user's phone using Bluetooth® technology for synchronization of data.<sup>d</sup>



Ability to add data on menstrual cycle dates, bleeding, spotting, and dates of sexual intercourse.



Clear display of test results and menstrual calendar displays, showing a summary of data for current and previous menstrual cycles.

## Using the Clearblue® Connected Ovulation Test System

In the first cycle of use, the Clearblue® Connected Ovulation Test System will calculate the days when the user should use the urinary ovulation test sticks based on the cycle length she has entered into the app. In subsequent cycles, the app will use her actual cycle length from collected data (unless she overrides it) to determine test days. After performing a test, the result will be ready to read on the test stick holder after 5 minutes and will automatically synchronize with the connected app, providing Bluetooth® is enabled on the user's phone.

### The Clearblue® Connected Ovulation Test System uses a unique adaptive algorithm

A clear circle or the words 'Low Fertility' will be shown on the test stick holder and app, respectively, when levels of hormones are below the personalized algorithm levels. The connected app will advise the user that it is unlikely that intercourse at this time will result in pregnancy. The user will be alerted by the app to test again the following day.



Trend analysis is applied to the E3G measurements to identify the first day of the sustained rise in E3G above baseline – upon which a flashing smiley face and 'High Fertility' will be shown. The user is advised that intercourse on a 'High Fertility' day will increase her chance of becoming pregnant, and that 'High Fertility' will be displayed until an LH surge is detected. The user will be alerted by the app to test again the following day.

As many women have low levels of LH in their urine, the algorithm used by the Clearblue® Connected Ovulation Test System sets a personalized threshold level by measuring changes in hormone levels from baseline. 'Peak Fertility' and a non-flashing smiley face are displayed when the LH surge is detected and will be displayed constantly for 48 hours. The user is advised that intercourse on this day and the following day will maximize her chance of getting pregnant, and that she should not test again during this cycle.



## How the Clearblue® Connected Ovulation Test System can help women

An estimated one in two couples may not be planning intercourse to coincide with their fertile period when trying to conceive.<sup>16</sup> There are only a limited number of days per cycle when conception can occur, and thus it is important that women time intercourse with their fertile days to maximize their chance of conception.<sup>11,12</sup>

Women in the developed world are increasingly delaying pregnancy,<sup>17</sup> but when they do decide the time is right to become pregnant they wish to do so quickly, leading to frustration, anxiety, and stress if they fail to do so.<sup>17,18</sup> Thus, correct timing of intercourse is important for these women, particularly as fertility declines with age; for example, a fertile 30-year-old woman has a 20% chance of conceiving each month, which declines to <5% for a 40-year-old woman.<sup>19</sup>

Many women have poor recall of their menstrual cycle history, even relating to their most recent cycle,<sup>20</sup> and inaccurately predict their ovulation day. In a cohort of 102 women seeking conception, only 13% correctly predicted their ovulation day, despite 62% having previously used home ovulation tests.<sup>16</sup> Based on these predictions, just 54.9% would have targeted intercourse to a time within their fertile window, and only 26% would have targeted their Peak Fertility days.<sup>16</sup>

The use of digital home-based ovulation tests has been shown to empower women with an increased understanding of their menstrual cycle.<sup>21</sup> Many women report that their use enabled effective planning of intercourse, offering them emotional support and making them feel less stressed when trying to conceive.<sup>21</sup> Randomized controlled clinical trials have also reported that the use of digital home-based ovulation tests does not cause stress in women trying to conceive.<sup>22,23</sup>

The Clearblue® Connected Ovulation Test System provides women seeking to conceive with a valuable, user-friendly, easily accessible tool to help them improve their fertility awareness and maximize their chance of conception,<sup>20</sup> with double the likelihood of becoming pregnant.<sup>1,a</sup>

## Benefit of the Clearblue® Connected Ovulation Test System over other apps

### Many calendar-based fertility apps are inaccurate

There are approximately 100 apps available to women to facilitate tracking their menstrual cycles and fertile window, to assist in either conceiving or avoiding pregnancy.<sup>24</sup> These apps use a variety of methods, or combination of methods, to determine the fertile window. Most apps rely on women entering menstrual cycle dates, basal body temperature (BBT), and/or cervical mucus characteristics. Some apps also enable the user to enter LH ovulation test results, or allow the use of connectable thermometers for direct input of BBT data.<sup>20</sup>



Many of the available fertility apps have been found to provide women with inaccurate information:

- It is well documented that calendar methods, which form the basis of many available apps, are unreliable for the identification of the fertile window due to intra-cycle variability in both cycle length and ovulation day
- Studies have reported that calendar-based ovulation prediction correlates with LH surge detection in less than 40% of cycles, with approximately 40% or more predicted fertile days falling outside of the 6-day fertile window<sup>25,26</sup>
- A review found only 19% of free menstrual cycle apps (available at the time of the study) were accurate, based on whether the menstrual cycle predictions were founded on  $\geq 3$  previous cycles, ovulation (when included) was predicted at 13–15 days prior to the next cycle, and no misinformation was included<sup>27</sup>
- Another study found just three out of 33 free fertility apps accurately predicted the fertile window, based on a standard estimate of a 28-day cycle, when ovulation would be predicted to occur on day 15, and fertile days would range from day 10–15<sup>28</sup>

### The Clearblue® Connected Ovulation Test System is based on sound science and is over 99% accurate at detecting the LH surge<sup>5</sup>

The technology used in the Clearblue® Connected Ovulation Test System is supported by publications in peer-reviewed scientific/medical journals.

- Clearblue® has published data on the accuracy of E3G and LH testing to predict the fertile window<sup>3,4,14</sup> and the accuracy of the fertility hormone assays used in the Clearblue® Connected Ovulation Test System to detect the fertile window<sup>29–31</sup>
- Clearblue® ovulation tests utilize the only LH assay clinically validated by comparison with ultrasound, showing 97% agreement with ultrasound observed timing of ovulation<sup>28</sup>

### The Clearblue® Connected Ovulation Test System has been proven to double the chances of conceiving in the first cycle of use<sup>1</sup>

The technology used in the Clearblue® Connected Ovulation Test System is supported by efficacy data from a study of 884 women aged 18–40 years who were seeking to conceive. This data highlighted that the use of the Clearblue® Connected Ovulation Test System doubled the chance of conception in the first cycle of use; 25.4% of women who were in the test arm, where the Clearblue® Connected Ovulation Test System was used, became pregnant after one cycle vs 14.7% of women who were in the control arm, where no ovulation test was used. An increased likelihood of pregnancy was still evident after two cycles of use (36.2% vs 28.6%, respectively).<sup>1</sup>

The Clearblue® Connected Ovulation Test System can therefore help women to time intercourse within their fertile window, increasing the likelihood of conceiving within two menstrual cycles.

## Limitations

- There are no products available that can guarantee success in becoming pregnant
- The Clearblue® Connected Ovulation Test System is not intended for contraceptive use or for women who do not have menstrual cycles
- Certain medical conditions and medications can give misleading results; for example if a woman is pregnant, or has recently been pregnant, has reached menopause, has impaired liver or kidney function, has polycystic ovarian syndrome, is taking fertility drugs containing luteinizing hormone or human chorionic gonadotropin, or is taking antibiotics containing tetracyclines
- Some fertility treatments such as clomiphene citrate may give misleading High Fertility results. Peak Fertility results should be unaffected
- Women should be advised to discuss unexpected results with their healthcare professional
- If a woman has recently been pregnant she should wait until she has had 2 cycles before testing
- If a woman has recently stopped using hormonal contraception, her cycles may be irregular so she should wait until she has had 2 cycles before testing
- Women should be advised to check with their healthcare professional if they are taking any medication or have any medical condition before planning a pregnancy
- The Clearblue® Connected Ovulation Test System may not be suitable for all women with a medically diagnosed fertility problem

## References

1. Johnson S, *et al.* Double the chances of conception in first cycle of use with new connected ovulation test. Poster P193 presented at Fertility conference, Birmingham, UK, 3<sup>rd</sup>–5<sup>th</sup>, January 2019.
2. World Health Organization. Temporal relationships between indices of the fertile period. *Fertil Steril.* (1983) 39: 647–655.
3. Roos J, *et al.* Monitoring the menstrual cycle: Comparison of urinary and serum reproductive hormones referenced to true ovulation. *Eur J Contracept Reprod Health Care.* (2015) 20: 438–450.
4. Johnson S, *et al.* Development of the first urinary reproductive hormone ranges referenced to independently determined ovulation day. *Clin Chem Lab Med.* (2015) 53: 1099–1108.
5. SPD data on file. Study of Clearblue® Digital Ovulation Test with Dual Hormone Indicator found >99% agreement with AutoDELFIA reference method in 100 cycles (all cycles had an LH surge >40 mIU/ml).
6. Tiplady S, *et al.* Detection of two urinary hormones by a new home ovulation test to identify the wider fertile window: a randomised comparative laboratory study of home ovulation tests. *Human Reprod.* (2013) 28(Suppl 1): i244
7. Johnson S, *et al.* Comparative study of home ovulation tests, including new dual-hormone test, to reference day of luteinising hormone surge. *BJOG* (2013) 120: PP2.05.
8. Lynch CD, *et al.* Estimation of the day-specific probabilities of conception: current state of the knowledge and the relevance for epidemiological research. *Paediatr Perinat Epidemiol.* (2006) 20 Suppl 1: 3–12.
9. Royston JP. Basal body temperature, ovulation and the risk of conception, with special reference to the lifetimes of sperm and egg. *Biometrics.* (1982) 38: 397–406.
10. Wilcox AJ, *et al.* Timing of sexual intercourse in relation to ovulation. Effects on the probability of conception, survival of the pregnancy, and sex of the baby. *N Engl J Med.* (1995) 333: 1517–1521.
11. Hilgers TW, *et al.* Cumulative pregnancy rates in patients with apparently normal fertility and fertility-focused intercourse. *J Reprod Med* (1992) 37: 864–86.
12. Stanford JB, *et al.* Timing intercourse to achieve pregnancy: current evidence. *Obstet Gynecol.* (2002) 100: 1333–1341.
13. Burger HG. Estradiol: the physiological basis of the fertile period. *Suppl Int J Gynecol Obstet.* (1989) 1: 5–9.
14. Godbert S, *et al.* Comparison between the different methods developed for determining the onset of the LH surge in urine during the human menstrual cycle. *Arch Gynecol Obstet.* (2015) 292: 1153–1161.
15. Robinson JE, Ellis JE. Mistiming of intercourse as a primary cause of failure to conceive: results of a survey on use of a home-use fertility monitor. *Curr Med Res Opin.* (2007) 23: 301–306.
16. Zinaman M, *et al.* Accuracy of perception of ovulation day in women trying to conceive. *Curr Med Res Opin.* (2012) 28: 749–754.
17. Bellieni C. The Best Age for Pregnancy and Undue Pressures. *J Family Reprod Health.* (2016) 10: 104–107.
18. Bunting L, Boivin J. Decision-making about seeking medical advice in an internet sample of women trying to get pregnant. *Hum Reprod.* (2007) 22: 1662–1668.
19. ASRM. Age and Fertility. A guide for patients (2012); Available from: <http://www.reproductivefacts.org/news-and-publications/patient-fact-sheets-and-booklets/fact-sheets-and-info-booklets/age-and-fertility/> (accessed June 2017).
20. McCartney PR. Nursing practice with menstrual and fertility mobile apps. *MCN Am J Matern Child Nurs.* (2016) 41: 61.
21. Jones G, *et al.* Women's experiences of ovulation testing: a qualitative analysis. *Reprod Health.* (2015) 12: 116.
22. Tiplady S, *et al.* Home ovulation tests and stress in women trying to conceive: a randomized controlled trial. *Hum Reprod.* (2013) 28: 138–151.
23. Weddell S, *et al.* Impact of home ovulation test usage on stress, psychological wellbeing and quality of life during evaluation of subfertility: a randomised controlled trial. In press (2017).
24. Duane M, *et al.* The performance of fertility awareness-based method apps marketed to avoid pregnancy. *J Am Board Fam Med.* (2016) 29: 508–511.
25. Blake KR, *et al.* Standardized protocols for characterizing women's fertility: A data-driven approach. *Horm Behav.* (2016) 81: 74–83.
26. Ellis J, Johnson S. Superiority of Clearblue home ovulation tests in detecting the peak fertile days of the menstrual cycle compared to a simple calendar method. *Hum Reprod.* (2011) 26(Suppl 1): i75–i77.
27. Moglia ML, *et al.* Evaluation of smartphone menstrual cycle tracking applications using an adapted APPLICATIONS scoring system. *Obstet Gynecol.* (2016) 127: 1153–1160.
28. Setton R, *et al.* The accuracy of web sites and cellular phone applications in predicting the fertile window. *Obstet Gynecol.* (2016) 128: 58–63.
29. Behre HM, *et al.* Prediction of ovulation by urinary hormone measurements with the home use ClearPlan Fertility Monitor: comparison with transvaginal ultrasound scans and serum hormone measurements. *Hum Reprod.* (2000) 15: 2478–2482.
30. Tanabe K, *et al.* Prediction of the potentially fertile period by urinary hormone measurements using a new home-use monitor: comparison with laboratory hormone analyses. *Hum Reprod.* (2001) 16: 1619–1624.
31. Bhiwandiwala PP, *et al.* Assessment of the clearplan easy fertility monitor in couples seeking conception assistance. *Obstet Gynecol.* (2001) 97: S29.

# Clearblue® Connected Ovulation Test System:

**Unique** – the first and only dual-hormone ovulation test that connects to the user's phone

**Personalized** – typically identifies 4 or more fertile days<sup>6,7</sup>

**Accurate** – the only brand that measures LH and E3G to accurately identify the fertile period<sup>29,30</sup>

**Tracking made easy** – ability to set smart, personalized reminders based on the user's cycle

**Interactive** – dates of intercourse and levels of menstrual bleeding can be entered and stored for reference

**Compare** – provides a summary of previous cycles for easy comparison and tracking of fertility data

**Recommended** – Clearblue® is the #1 ovulation brand recommended by OB-GYNs<sup>f</sup>

<sup>a</sup> In the first cycle of use, vs not using ovulation tests.

<sup>b</sup> Based on international sales compiled using independent market research (data on file).

<sup>c</sup> Data on file.

<sup>d</sup> When Bluetooth® is switched on.

<sup>e</sup> vs not using a method to identify fertile days.

<sup>f</sup> Survey of 204 OB-GYNs in the US conducted by Kantar Health on recommendation of home ovulation tests and fertility monitors (2011).

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Compatible with most iPhones® and Android™ phones equipped with Bluetooth 4.0/BLE. To find out more about compatibility, check out [www.clearblue.com/connectivity](http://www.clearblue.com/connectivity).



For more information about the Clearblue® Connected Ovulation Test System, please visit our websites:

[www.clearblue.com](http://www.clearblue.com)

[www.swissprecisiondiagnostics.com](http://www.swissprecisiondiagnostics.com)



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