

## Is there a perfect age to freeze your eggs?

With the procedure still in its infancy and the considerable expense involved, it's far too soon to know if egg freezing is all it's cracked up to be. But a new study has identified the smartest time to get those eggs on ice.

Nov 12, 2015 Lorna James



Egg timer photo, Creative Crop/Getty Images.

It had been, for Christine, an eventful two months: She'd ditched her job as a sales representative, marked her 35th birthday and started a promising new relationship with a man she'd met at a downtown Toronto club. And then she froze her eggs.

“They’ve been freezing sperm for a bazillion years — everybody knows that,” Christine says. But until a girlfriend mentioned the procedure over dinner — the pair had been trading fears about their age and fertility — Christine had never heard of egg freezing. This was nine years ago, more than half a decade before egg freezing entered the mainstream, with Kim Kardashian exploring the possibility on (where else?) her TV show and Sofia Vergara confiding to *Vogue* that she was midway through the process. “I thought, ‘If this is available, I should get it,’” Christine says. “I looked at it as an insurance policy. Obviously, deep down, I hoped I wasn’t going to have to use the eggs — that I would conceive naturally. But if push came to shove, they’d be good to have.”

Christine’s brand new boyfriend, Matthew, was entirely supportive, even dispatching the necessary daily hormones from a pen-like needle into her belly. “It took some of the pressure off our relationship,” she says, adding, “I couldn’t have done it without him. I hate needles.” After her retrieval process at a fertility clinic, Christine ended up with 10 successfully frozen eggs.

The couple married in 2012, when she was 40 and he was 35, and quickly began trying to conceive. After six months, they opted for intrauterine insemination (IUI), where sperm is deposited directly into the uterus. Nothing happened. They moved to in vitro fertilization (IVF), with an embryo made from a fresh egg. Nothing. That’s when Christine decided to dip into her egg stash.

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Getting a frozen egg to thaw successfully is just the beginning of the assisted-reproduction process. Christine learned that of her 10 eggs, eight were mature enough for fertilization. Of those, only four successfully united with sperm to become embryos. And of those, two failed to implant almost immediately. Down to her last two eggs, Christine finally got pregnant. The couple’s daughter is now five months old.

Unsurprisingly, they are strong believers in egg freezing. “I would recommend it 1,000 percent,” says Christine (who asked to use a pseudonym so that she can choose when to tell her daughter the conception story). “I cannot even begin to explain what a fantastic idea that was.” Christine could be a poster child for how the process is supposed to work: A single woman takes control of her reproductive future, liberates herself to wait for the right time to conceive and then is able to get pregnant when other options fail. That’s a pretty sweet scientific success story. And it’s why, after centuries of paying anxious, obsessive attention to the second hand of our biological clocks, women are so seduced by the promise that we can pause the dreaded ticking.

The hitch is that, for now, Christine is a rarity — not necessarily because she successfully conceived from frozen eggs, but because she used those eggs at all. “There’s lots of freezing going on, but a lot less thawing,” says Tom Hannam, a reproductive endocrinologist. Since he opened his Toronto clinic, Hannam Fertility, last year, he’s frozen eggs for about 30 clients and thawed only part of one set (the embryo hasn’t yet been transferred). Because egg freezing is in its infancy, there’s a great deal we still don’t know: how long those eggs can stay frozen for, how exactly they’ll behave when thawed and how likely they are to result in pregnancy and then in birth.

And it doesn’t look like much of that information is coming any time soon. “It’s probably going to be 20 years until we have solid data on if people are using their frozen eggs,” says Tolga Mesen, a physician at the Georgia Center for Reproductive Medicine in Savannah, Georgia. But there are other data out there on the broader population — research on fertility rates, on the chance of miscarriage, on egg retrieval for women undergoing IVF, on the likelihood that women would try implanting again if unsuccessful — that can help determine whether egg freezing is actually worth it, and if so, for whom.

Mesen and a team at the University of North Carolina at Chapel Hill mined that data in a study for the American Society for Reproductive Medicine, published in June in the journal *Fertility and Sterility*. Egg freezing may be marketed to just about every woman right now — the twentysomething woman looking to be proactive, the fortysomething woman staring down fertility’s cliff, the professional woman wanting to focus on her career, the single woman waiting a bit longer for the One — but Mesen discovered that, far from being a one-freeze-fits-all solution, the procedure has a specific window. The very best time for healthy women to freeze their eggs is 32 and 33. And once they’ve passed 37, there’s not much point.

Egg freezing — or, technically speaking, oocyte cryopreservation — isn’t a new procedure: The first baby born from a thawed egg will turn 30 in 2016. Until recently, though, the method used wasn’t terribly reliable. The ovum may be the biggest cell in the body, but it’s incredibly fragile and largely made of water, which makes it tricky to freeze. Ice crystals can develop and then crack upon thawing, destroying the delicate spindles of DNA and resulting in a high percentage of miscarriages or abnormalities. Early on, those who attempted the procedure were often cancer patients, largely because they were facing treatment-related infertility and freezing was presented as their best option.

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Toronto theatre student Dani Taylor was diagnosed with stage 3 colorectal cancer in 2013, when she was 23. She learned that her pelvic radiation would guarantee early menopause, while chemotherapy would probably destroy her eggs and ovaries. Egg freezing was available to her, she was told, but only within a two-week period. Delaying her cancer treatment any longer was just too dangerous.

Luckily, says Taylor, she “won the menstruation lottery”: She was at exactly the right time in her cycle to make immediate egg retrieval viable. So, in the midst of putting school on hold, moving back in with her parents and determining her cancer-treatment plan, she was also undergoing daily imaging of her reproductive system and injecting herself every 12 hours with hormones to encourage her body to produce more eggs. “That period of time is a bit of a blur,” she says. “I would just buy hormones, throw them on my credit card.” It seemed surreal, especially considering the state of her health. Her fertility clinic was above a Louis Vuitton store, and more than once, Taylor wondered if it might make more sense to spend the money on a gorgeous handbag to enjoy during her last days.

Taylor’s eggs were frozen through a relatively new process called vitrification. Commonly known as “flash freezing,” it turns the liquid inside an egg into a substance somewhere between water and ice, reducing the likelihood of internal damage. Because of this improvement, the American Society for Reproductive Medicine removed the “experimental” label from vitrification in 2012. That’s when the lure of “social egg freezing” — putting your eggs on ice not for health reasons but to postpone motherhood — began to really take off.

Last year, the *New York Post* ran a story about “fashionable New York professional women” sipping champagne at “egg-freezing parties,” where an outfit called EggBanxx tells them how the procedure is done (and how it will leave them feeling “empowered” about their reproductive choices). *Bloomberg Businessweek* splashed “Freeze your eggs, free your career” in pink print across its cover. Facebook and Apple got on board with the procedure: As of January, both tech giants offer it as part of their insurance plans. And women got on board too. While no reliable Canadian numbers are available, according to *Time*, 5,000 American women froze their eggs in 2013 — 10 times more than in 2009. EggBanxx’s founder told the magazine that 76,000 women each year would be freezing their eggs by 2018 (though the company does have a vested interest in making it all sound easy and mainstream).

But undergoing the procedure does mean coughing up a considerable amount of cash. In Canada, the initial egg-retrieval process costs between \$6,000 and \$8,000, plus hormones and medications that can range from \$3,000 to \$6,000. Annual storage is roughly \$350. Once the time comes to thaw and fertilize, the bill runs around \$5,000, and if you need donor sperm, tack on about \$600 to \$800. (In October, Ontario announced it would cover one round of IVF; Quebec, the only other province to do so, plans to scale back its funding.)

Of course, that's small change if you badly want a child. And women keep pushing back when they start procreating. In 1971, the average age of a first-time mom in Canada was 23; in 2011, it was 28, with nearly one in every three first-time mothers at least 35 years old, the age at which conception becomes more difficult and there are greater challenges carrying a pregnancy to term. Yes, younger eggs are more likely to result in successful pregnancies. But egg freezing can be "a bit of a double-edged sword," says Aaron Jackson, a fertility specialist at the Ottawa Hospital. She wouldn't want women to get a false sense of security because they've got some eggs in the bank and therefore delay attempting to get pregnant even longer. "A lot of women just don't understand reproductive age."

Some fertility clinics won't provide egg freezing for women 38 or older, but Tom Hannam doesn't have a firm cut-off; rather, he tries to educate honestly and let women decide for themselves. "The treatment is laborious," he says. A woman with a modest egg supply who expects to start trying to conceive at 43, for example, will probably have to go through 10 rounds of IVF for a live birth. Since not all of her eggs will be healthy or thaw properly, she'd need 50 eggs to freeze; at her age, she'll likely get about four per retrieval cycle. "The odds are getting awfully low," says Hannam. "Women realize it's just not realistic."

With its no-nonsense title, "Optimal Timing for Elective Egg Freezing," Tolga Mesen's study aimed to find that sweet spot for both fertility and financial means. "We know that the younger [you are when you freeze], the better, but is it worth spending \$10,000 when you're 25?" Mesen says. "Couples don't have \$10,000 at 25 — they have it when they're 40. We were answering two questions: 'When is the best time to freeze eggs to have the most likely chance of a live birth?' and 'When is it most cost-effective?'"

**Part of why so few women are thawing their eggs is that when the time comes for a baby, their reproductive systems work just fine.**

Mesen and his team created a model for hypothetical women between 25 and 40 years old, mapping out for each age all the ways a woman's reproductive decisions might go. They took into consideration that some women would be prepared to use donor sperm, while others would attempt to conceive only with a spouse; for that second group, they accounted for the chance of marriage after a certain age. The likelihood of miscarriage increased as each woman got older, while the probability that she would try again (either through intercourse or IVF) went down. The result that mattered was a baby, not a successfully frozen egg, thawed egg or inseminated egg.

The paper's main conclusion is fairly obvious: Women who froze eggs before age 34 retrieved the highest number of healthy ones, providing them with the strongest likelihood of conceiving and giving birth. But part of why so few women are thawing their eggs, Mesen says, is that when the time comes for a baby, their reproductive systems work just fine, and they don't end up needing the DNA they've put on ice. "The problem is, many women who come in are 39," he says. By then, the chances of having enough healthy eggs for a successful pregnancy become heartbreakingly low.

But the decision to freeze your eggs isn't made in a vacuum. For the vast majority of women, the substantial cost is a serious consideration, and women in their 20s have such a high chance of having a baby naturally before they turn 35 that egg retrieval, freezing, storage and thawing likely just aren't worth the money. If they want to be the age when freezing is most cost-efficient — and the age when it has the largest benefit over no action at all — they'll need to wait a little longer. That age, Mesen's team discovered, is 37 years old.

Though egg freezing has been peddled as an insurance policy suitable for pretty much anyone, from single women to career women to the young to the not-so-young, there's still much we don't know about the procedure and much we won't know for another 10 or 20 years. But by establishing this optimal five-year window, Mesen's study adds a crucial piece of information to all that uncertainty. In doing so, it can help nudge some women through the door of a fertility clinic a little sooner — and give other women the reassurance of a little more time. In fact, the team has even developed an egg-banking calculator to help would-be freezers determine its potential benefit.

Ultimately, women considering their fertility will have to decide for themselves about the usefulness of egg freezing. It may depend on how strong their desire is to be a parent, and how much financial weight they have to throw behind that desire. It may depend on whether they're waiting for the partner of their dreams, or whether the sperm of their dreams will do. And it may depend on how close they are to 37.

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