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Could Hormone Therapy Prevent Frozen Shoulder?

A large new study found a striking connection between the two. An orthopedic surgeon explains what the research does—and doesn't—tell us.

By Lisa Arbetter   Published: Aug 18, 2026 11:14 AM EDT

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Eavesdrop on any conversation among women in midlife, and you're bound to hear about the mysterious injury someone sustained while sneezing, sleeping, or performing the apparently high-risk maneuver of getting off the couch. At least in those cases, there's a culprit.

Frozen shoulder is another story. Medically known as adhesive capsulitis, frozen shoulder causes pain and progressive stiffness in the shoulder joint, often with no obvious trigger. You didn't fall, lift anything heavy, or make one spectacularly ill-advised move. Your shoulder simply started hurting—and then it refused to move. Suddenly, hooking a bra, washing your hair, or reaching into a cabinet feels nearly impossible.

Frozen shoulder disproportionately affects women between the ages of 40 and 60, which happens to be the same stretch of life when many of us are also lying awake at 3 a.m., kicking off the sweaty covers. That menopausal timing has researchers asking whether plummeting estrogen could be part of the reason.

A new survey of more than 10,000 women, led by Jocelyn Wittstein, MD, an orthopedic surgeon at Duke University School of Medicine, adds weight to that possibility. Dr. Wittstein has been studying the connection between estrogen and frozen shoulder for several years, and her team published what is believed to be the first known preliminary study on menopausal hormone therapy and frozen shoulder earlier this year (although the findings were first presented in October 2022).

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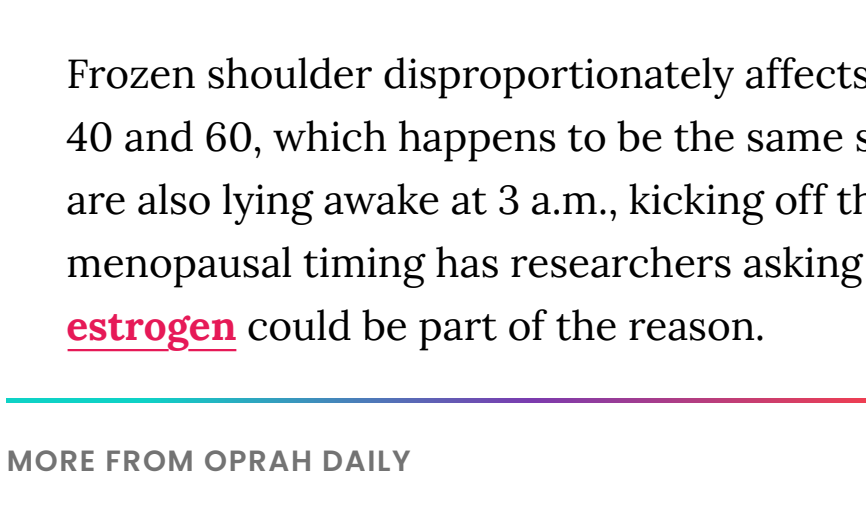

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We spoke with Dr. Wittstein about the findings of her latest study, what they could mean for women in midlife, and the truly astonishing theory doctors once had about the "type" of woman who developed frozen shoulder. Note: At the time of our conversation, the research had been presented at the American Orthopaedic Society for Sports Medicine's annual meeting in July but had not yet been published in a peer-reviewed journal.

Your new research found a striking difference in frozen-shoulder rates between women who used hormone therapy and those who didn't. What did you find?

We received survey responses from more than 17,000 women, and 10,981 met the criteria for this analysis. The groups were fairly evenly divided: 47 percent were using hormone therapy, and 53 percent were not.

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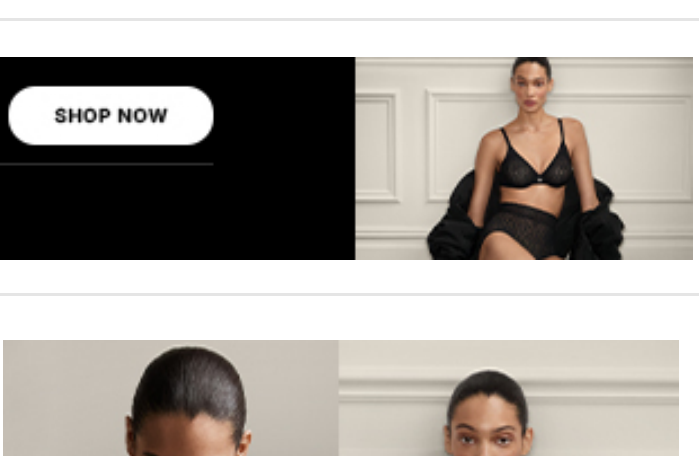
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Among the women using hormone therapy, 3.2 percent reported being diagnosed with adhesive capsulitis after starting it. Among the women who weren't using hormone therapy, 26.8 percent reported adhesive capsulitis. That means frozen shoulder was about eight times more common among the women who weren't using hormone therapy. We also accounted for race, diabetes, and thyroid disease—the latter two are known risk factors for frozen shoulder—and the association remained statistically significant.

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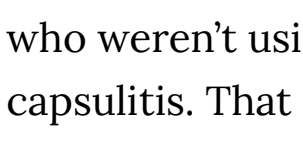
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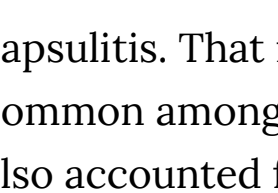
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So does that mean hormone therapy prevents frozen shoulder?

No. This study can't tell us that with certainty.

It was a survey, so we relied on women to report that they had been diagnosed with frozen shoulder. That isn't the same as going into every participant's medical record and confirming the diagnosis. We also didn't look at different hormone therapy formulations or doses.

What we found is a strong association—one that gives us a good reason to keep studying the connection. But it isn't proof that hormone therapy prevents frozen shoulder.

What does estrogen have to do with the shoulder?

Estrogen levels fluctuate significantly in perimenopause and decline at menopause, reducing some of the anti-inflammatory effects of estrogen on the lining of the shoulder joint. Another theory centers on specific cells in the lining of the shoulder joint called fibroblasts. Estrogen appears to help regulate them. As estrogen declines, those cells may become overactive, contributing to inflammation, thickening, and stiffness in the joint lining.

This is the reasoning behind the hypothesis, and we have basic science to support it. But we need more research before we can say exactly how much of a role hormonal changes play.

Frozen shoulder is probably multifactorial, and you don't have to be in perimenopause or menopause to develop it. And even women on hormone therapy can get frozen shoulder. Hormones are likely one piece of the story, not the whole story.

You also compared physical function scores in women with different severities of hot flashes and night sweats. What did you find?

Forty-four percent of the women in the study reported hot flashes, night sweats, or both. Of those women, 27 percent described their symptoms as mild, 63 percent as moderate, and 10 percent as severe. Women with severe menopausal symptoms scored significantly worse on general measures of physical function—including a score for upper extremity function [though not specifically for frozen shoulder]—than women who weren't experiencing hot flashes or night sweats at all.

One possible explanation is that if you're having a rougher time with estrogen withdrawal in one aspect of menopause, you may be having a rougher time with other systems affected by menopause.

Sleep could also be a big piece of it. If night sweats are keeping you awake, that can affect how you function and how your body experiences pain. But these are still questions we need to investigate further.

Some women started hormone therapy after they had already developed frozen shoulder. What happened to them?

Among the women who started hormone therapy after being diagnosed—but before their frozen-shoulder symptoms had resolved—57 percent, or 445 women, said their symptoms improved after they began hormone therapy.

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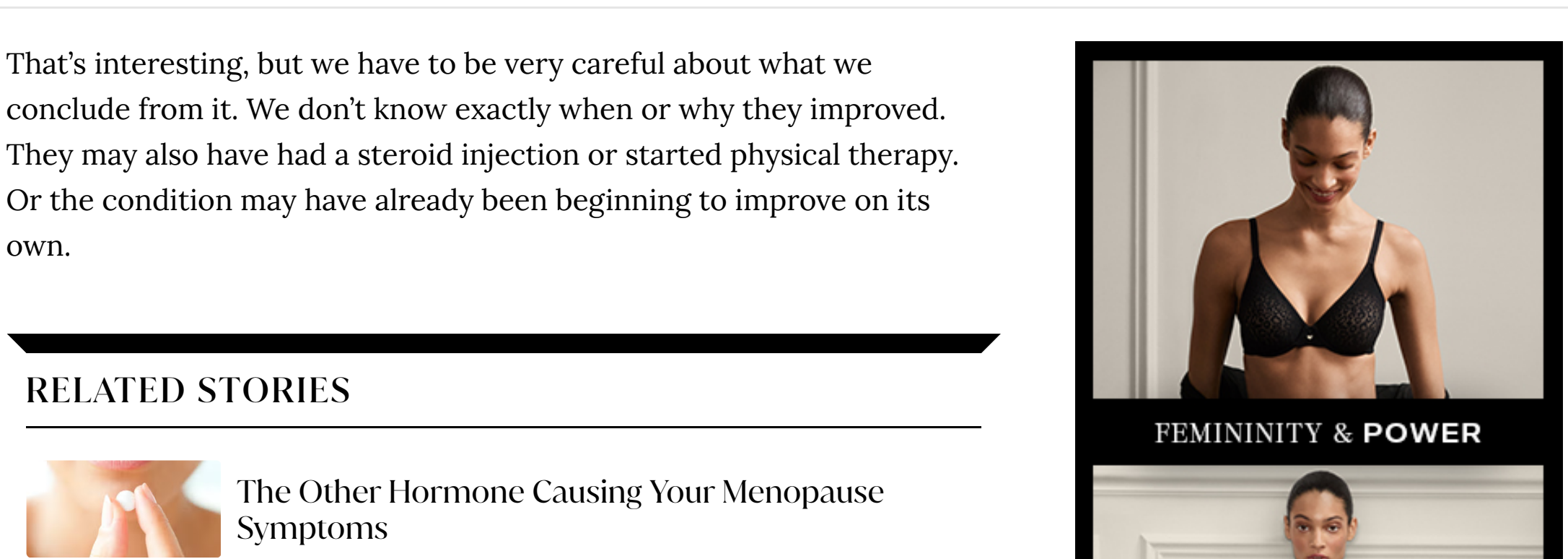
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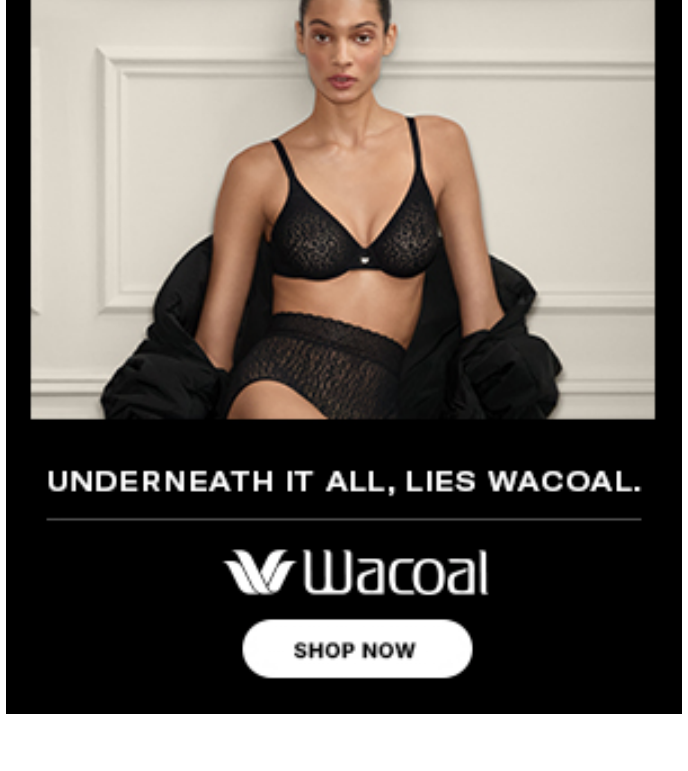
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That's interesting, but we have to be very careful about what we conclude from it. We don't know exactly when or why they improved. They may also have had a steroid injection or started physical therapy. Or the condition may have already been beginning to improve on its own.

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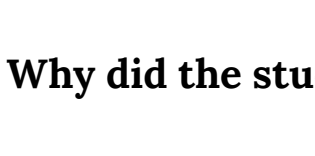
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Why did the study exclude women with a history of breast cancer?

We excluded them because they have a distinct set of risk factors. Chemotherapy can push some women into an earlier menopause. Aromatase inhibitors, which are commonly used in breast cancer treatment, sharply reduce estrogen and are associated with joint pain. There's even a name for the constellation of symptoms: aromatase inhibitor musculoskeletal syndrome.

Breast cancer survivors may also have had surgery, radiation, or lymphedema that can limit how much they can move one arm. And many aren't able to use hormone therapy, which means they would have fallen disproportionately into the no-hormone-therapy group while also having additional reasons for shoulder problems.

I don't want anyone to read that exclusion as dismissal. Breast cancer survivors may actually be at higher risk [of frozen shoulder], not lower, and we plan to study that population separately. If you're a breast cancer survivor and your shoulder is becoming painful or stiff, that's all the more reason to have it looked at early.

When should someone get shoulder pain checked out?

If you have severe new shoulder pain that has lasted more than a week, isn't improving with something like acetaminophen or an anti-inflammatory, and is accompanied by increasing stiffness, it's worth seeing someone. That's especially true for women between 40 and 60, because they're at higher risk for the condition.

I cannot tell you how many women I see who wait three or four months. By the time they come in, they can't wash their own hair. The earlier we recognize it, the more opportunity we have to calm the inflammation before the shoulder becomes extremely stiff and difficult to "thaw."

Is this a situation where you should stretch through the pain?

Not necessarily—and this is one of the mistakes I see all the time. Women adopt a no-pain-no-gain approach and push the shoulder into a very painful position. During the early inflammatory phase, that can sometimes make the condition worse. The shoulder can rebound and become even stiffer.

You do want to keep it moving within a range you can tolerate. But that's very different from forcing it through severe pain.

How is frozen shoulder treated?

Physical therapy is one of the main treatments. But early on, some women are in so much pain that they can't tolerate it. A steroid injection into the shoulder joint can reduce the inflammation and pain enough to help someone sleep, function, and participate in physical therapy. We're generally cautious about overusing steroid injections in orthopedics, but frozen shoulder is a really good indication for one.

If someone has already been very stiff for several months, an injection may not help as much. At that stage, physical therapy may play a larger role.

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A small percentage of people with severe, persistent stiffness may need minimally invasive surgery. We use a small camera to go into the shoulder, release the tight tissue and adhesions, and manipulate the joint to restore movement. Obviously, we'd rather avoid that—which is one more argument for not waiting.

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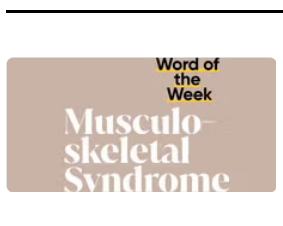
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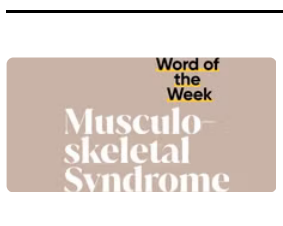
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Should a woman with frozen shoulder ask her doctor about hormone therapy?

If you have frozen shoulder and you're also experiencing hot flashes, night sweats, irregular cycles, or disrupted sleep, that overlap is worth bringing up with a women's health provider.

Your orthopedic surgeon probably isn't going to ask whether you're having hot flashes or irregular periods. That isn't traditionally how most orthopedic surgeons are trained. I ask because I see so much of this, and I refer women to women's health specialists when those symptoms overlap. But most women are going to have to make that connection themselves.

Before researchers started looking at hormones, why did doctors think frozen shoulder affected so many women?

Dating back to the '50s, there was a theory in the medical literature that a certain kind of person developed frozen shoulder—essentially, an anxious woman. It was taken seriously enough that researchers eventually studied whether this personality type existed. Thankfully, a well-done study in 2014 didn't support the idea.

What I think may have been happening is that doctors were seeing a lot of 52-year-old women who were having severe hot flashes, not sleeping, living with joint pain, and understandably feeling anxious about all of it. Orthopedics was nearly all male then, and it's still overwhelmingly male. You can see how a group of exhausted, aching women wondering what on earth was happening to them might have been interpreted as having a certain personality rather than going through a hormonal transition.

What's the most important thing women should know about this condition?

It's extremely painful, it can cause a tremendous amount of disability, and it can drag on for a long time. But women often don't realize they're at risk—or that what they're experiencing isn't something they simply have to tolerate.

The more women know about frozen shoulder, the more likely they are to recognize it and seek treatment early. And the earlier we treat it, the better the chances of keeping it from becoming severely stiff and drawn out.

Editor's note: This interview was lightly edited and condensed for clarity.

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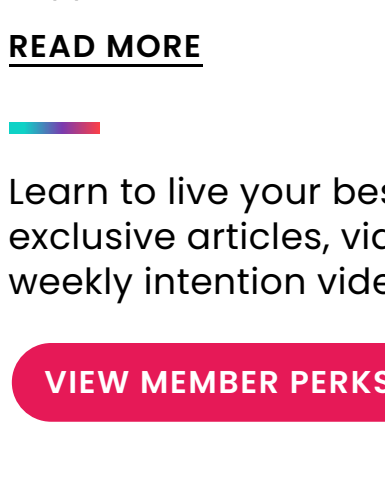

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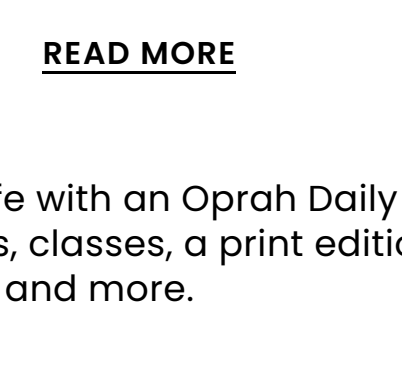

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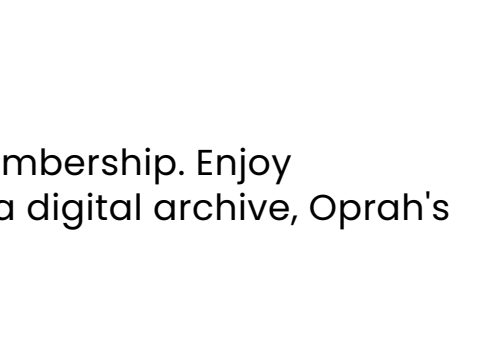

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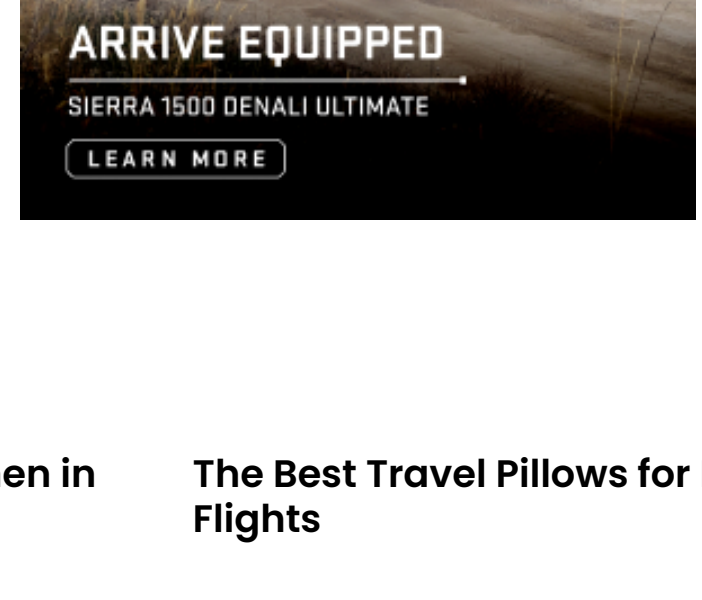
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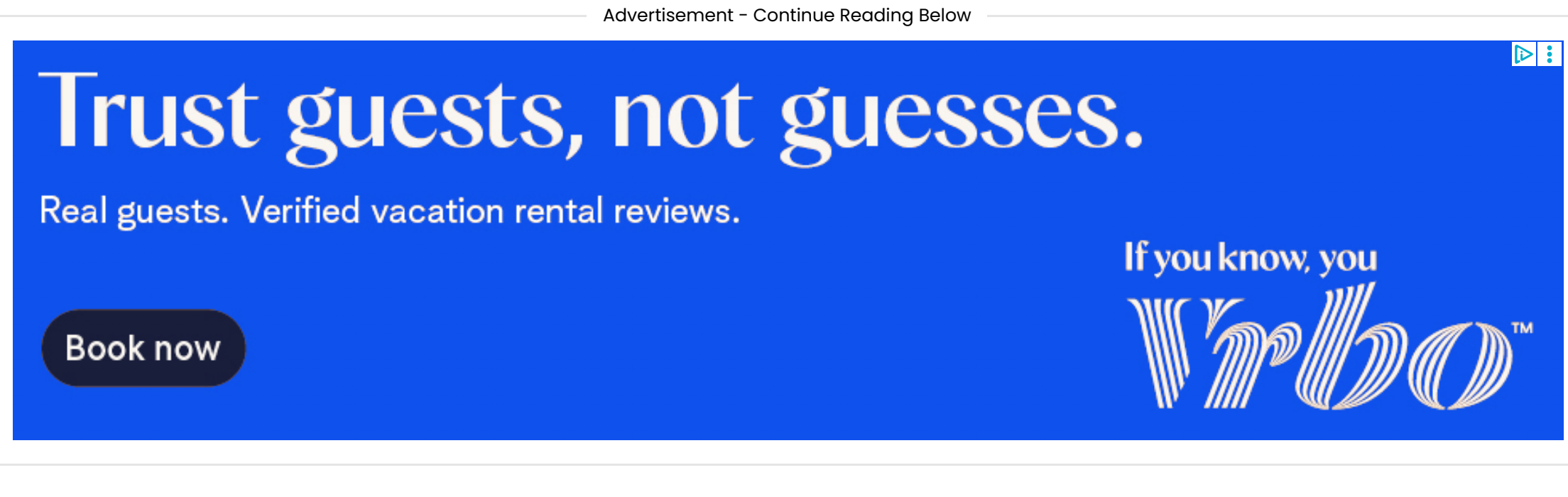
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