



# Q / Ferning in amniotic fluid: Is it a useful indicator of ruptured membranes?

## EVIDENCE-BASED ANSWER

**A** / **YES.** The presence of arborized crystals (ferning) in amniotic fluid is both sensitive (74%-100%) and specific (77%-100%) for diagnosing rupture of membranes in laboring women who report loss of fluid (strength of recommendation [SOR]: **A**, multiple prospective cohort studies). However, it is much less sensitive

and specific for women with fluid loss who aren't in labor (SOR: **B**, 1 prospective cohort study).

Gross contamination of amniotic fluid with blood or antiseptic solutions may decrease the diagnostic accuracy of ferning, whereas contamination with meconium doesn't (SOR: **C**, bench research).

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## Evidence summary

A nonsystematic review of 11 prospective cohort studies (N=2804) reported that ferning was both sensitive and specific for the presence of amniotic fluid in laboring women who reported fluid loss. Labor was defined as contractions with subsequent delivery of a baby. Ferning had a mean sensitivity of 96% (range, 74%-100%) and a mean specificity of 96.2% (range, 77%-100%).<sup>1</sup>

## Helpful in laboring women, but less so in those who are nonlaboring

A prospective cohort study evaluated the sensitivity and specificity of ferning among women reporting fluid loss who were in labor compared with women who weren't in labor. Investigators classified laboring women (n=51) as having continued fluid loss and no fetal membranes covering the presenting part and progressing to delivery. They considered women to be nonlaboring (n=100) if they had minimal fluid loss and fetal membranes covering the presenting part or didn't progress to delivery (investigators diagnosed 39 women with ruptured membranes on clinical

grounds). Ferning was 98% sensitive and 88.2% specific in laboring women, and 51.3% sensitive and 70.5% specific in nonlaboring women.<sup>1</sup>

## Ferning occurs from 14 weeks of gestation onward

A prospective case series (N=400) determined that amniotic fluid would fern at all gestational ages between 14 and 41 weeks. Investigators obtained fluid samples by amniocentesis and confirmed that they were 100% nitrazine-positive.<sup>2</sup> They found more consistent ferning in samples dried on a slide for 10 minutes than samples dried over a flame (100% vs 86.7% of 112 samples).

## Some contaminants in amniotic samples affect ferning

In vitro studies evaluated ferning in samples of amniotic fluid mixed with blood, meconium, or vaginal fluids. Blood contamination didn't affect ferning unless the sample contained more than 10% blood.<sup>3-5</sup> Meconium (which itself verifies ruptured membranes) didn't change the fern pattern at any dilu-

tion,<sup>6</sup> nor did vaginal discharge.<sup>3</sup>

Antiseptic solution may cause false-positive results, as may semen, fingerprints, and cervical mucus—although none of these show the fine arborization or discrete crystallization seen in uncontaminated amniotic fluid.<sup>6,7</sup>

## Recommendations

The American College of Obstetricians and Gynecologists says that ferning is a confirmatory test for ruptured membranes, to be used along with pooling in the vaginal vault, and that premature membrane rupture is confirmed by fluid passing from the cervical canal.<sup>8</sup> **JFP**

### References

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Sponsored by the Primary Care Metabolic Group and the Primary Care Education Consortium and supported by funding from Novo Nordisk Inc.