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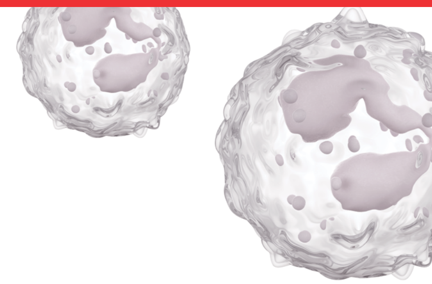


Tryptase testing in suspected systemic allergic reaction

Insights into the connection between transiently elevated tryptase levels and mast cell activation indicating possible anaphylaxis

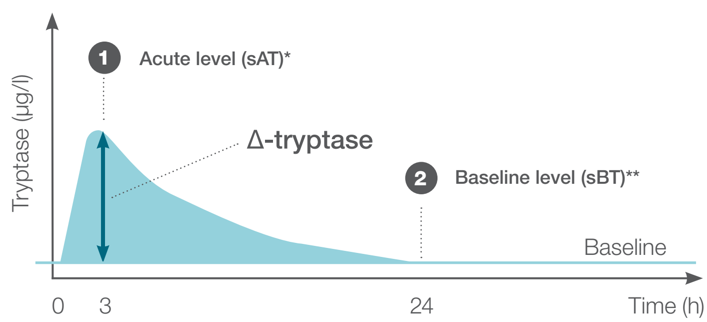
Anaphylaxis is a systemic hypersensitivity reaction usually involving two or more organs including skin/mucus membranes, airways, cardiovascular, and/or gastrointestinal systems. The World Allergy Organization (WAO) provides diagnostic criteria based on clinical parameters.[1,2] Because anaphylaxis can potentially be life threatening, paired acute and baseline tryptase levels aid in differential diagnosis (including mastocytosis or other mast cell disorders), patient management and follow up care. Tryptase is a useful biomarker as an aid in investigating systemic allergic reactions[3,4] as it has been shown to be released into the circulatory system during anaphylaxis.[4,5]

When measuring tryptase levels – timing is important

Leading global allergy authorities such as WAO, AAAAI/ ACAAI and EAACI recommend taking two serum tryptase measurements[3-8] for comparison:

- **Acute level (sAT)*:** as soon as possible after the clinical reaction onset (+15 minutes up to 3 hours).[3,4,8,9]
- **Baseline level (sBT)**:** 24-48 hours after complete resolution of all clinical signs and symptoms.[3,4,8,9]

If the change (Δ) in tryptase levels (sAT - sBT) is ≥ 20% of the individual's sBT + 2 µg/l then mast cell activation is indicated.[2,3,7,8,10] Note that seemingly normal serum tryptase levels do not preclude that an anaphylactic reaction has occurred,[2-5,7,9,11] so performing the calculation can help identify possible mast cell activation that might otherwise be missed.[8,11]



If mast cell activation is indicated, the WAO and EAACI recommend referral to a specialist (e.g., allergist, immunologist) for follow-up, along with other measures such as counseling, before patient discharge from the acute care setting.[2,5,6,8,9,12]

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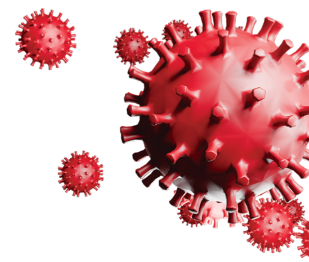
*serum Acute Tryptase **serum Baseline Tryptase thermoscientific



Measure tryptase levels twice

when systemic allergic reaction is suspected

Systemic allergic reaction & COVID-19 vaccines

Due to the global COVID-19 pandemic and rollout of vaccine initiatives, it is important to have increased awareness that, to date, the incidence rate of anaphylaxis associated with first doses of three major COVID-19 vaccines exceeds the estimated incidence rate of anaphylaxis associated with other vaccines (2 to 11.1 per million[13-16] vs approximately 1 per million[12,16-18]).

Guidelines for tryptase testing for suspected COVID-19 vaccine-associated anaphylaxis

Global allergy organizations such as WAO and EAACI-ARIA issued statements and/or guidelines[12,16-19] on the diagnosis, management, and prevention of severe allergic reactions to COVID-19 vaccines. As patient history and symptomology is often ambiguous, tryptase testing is critically important for accurate diagnosis and to minimize future risk of severe allergic reactions in vaccinated individuals.[17] As is the case with other anaphylactic events, the same organizations recommend affected individuals follow-up with a specialist (e.g., allergist, immunologist) to determine if a second dose of COVID-19 vaccine should be given.[12,16,19]

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The cleared intended use of ImmunoCAP Tryptase differs in the United States.

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