

# ST2, Soluble

## *FOR USE AS AN AID IN THE RISK STRATIFICATION OF PATIENTS WITH HEART FAILURE OR ACUTE CORONARY SYNDROMES*

### Test Highlights

- Soluble ST2 complements the prognostic value of NT-proBNP.
- Soluble ST2 is useful in risk stratification and assessment in patients with known cardiovascular disease.

### Pathophysiology

- ST2 is a member of the IL-1 receptor family that is produced by cardiac fibroblasts and cardiomyocytes under conditions of mechanical stress. The ST2 ligand, IL-33, is also secreted by stretched cardiac fibroblasts and has antihypertrophic effects on myocardium.
- Soluble ST2 (sST2) is believed to function as a decoy receptor by binding IL-33 and abrogating the otherwise cardioprotective effect of IL-33 signaling through the cell membrane-bound form of ST2.<sup>1</sup>

### Clinical Background

- In multiple peer-reviewed publications, sST2 has been shown to be an aid in the risk stratification of patients with heart failure (HF) or acute coronary syndrome (ACS).<sup>2-4</sup>
- sST2 assesses a biochemical pathway different than the natriuretic peptides BNP and NT-proBNP. sST2 has been shown to complement the prognostic value of NT-proBNP.<sup>3</sup> Patients with elevated concentrations of both biomarkers are at greater risk of mortality than those with an elevation of only one sST2 or NT-proBNP.
- Unlike the natriuretic peptides, sST2 is primarily useful in risk stratification and assessment in patients with known cardiovascular disease and has not been shown to add to the diagnosis of heart failure or other cardiovascular diseases.<sup>3,5</sup>

### Interpretation

- Serum sST2 concentrations greater than 35 ng/mL correspond to increased 30-day and one-year mortality in patients with heart failure<sup>3</sup> and/or acute coronary syndromes.<sup>4</sup> This risk has been shown to increase continuously with rising concentrations of sST2.<sup>4-5</sup>

- A decrease in sST2 concentrations is associated with a decreased risk of mortality at one year or increased risk in patients who have had heart transplant, myocardial infarction followed by percutaneous coronary intervention, or coronary artery bypass graft.<sup>6-8</sup>
- Reference intervals for sST2 were determined to be 10.4–52.1 ng/mL for males and 8.4–33.6 for females, respectively.<sup>9</sup>
- The biological variability or reference change value for healthy individuals was 30 percent.<sup>10</sup>

### Limitations

- This test uses a kit designated by the manufacturer as “for research use, not for clinical use.” The performance characteristics of this test were validated by ARUP Laboratories. The U.S. Food and Drug Administration (FDA) has not approved or cleared this test. The results are not intended to be used as the sole means of clinical diagnosis or patient-management decisions. ARUP is authorized under Clinical Laboratory Improvement Amendments (CLIA) and by all states to perform high-complexity testing.
- Interference from anti-reagent antibodies in the patient sample has not been demonstrated, but the possibility of interference cannot be ruled out.

### Methodology & Analytical Performance

sST2 is measured using a commercially available, highly sensitive enzyme-linked immunosorbent assay.

### Related tests

- B-Type Natriuretic Peptide (0030191)
- proBrain Natriuretic Peptide, NT (0050083)

## References

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2. Daniels LB, et al. Association of ST2 levels with cardiac structure and function and mortality in outpatients. *Am Heart J* 2010;160:721–8.
3. Januzzi JL, Jr, et al. Measurement of the interleukin family member ST2 in patients with acute dyspnea: results from the PRIDE (Pro-Brain Natriuretic Peptide Investigation of Dyspnea in the Emergency Department) study. *J Am Coll Cardiol* 2007;50:607–13.
4. Eggers KM, et al. ST2 and mortality in non-ST-segment elevation acute coronary syndrome. *Am Heart J* 2010;159:788–94.
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7. Grant MC, et al. Abstract 4778: Postoperative ST2 blood concentrations predict one year mortality in coronary artery bypass patients. *Circulation* 2008;118:S 942. (Data analysis was completed with earlier version of ST2 assay, so reference values will differ.)
8. Pascual-Figal DA, et al. Characteristics of the interleukin family biomarker ST2 after heart transplantation. ESC Congress 2009. (Data analysis completed with earlier version of ST2 assay so reference values will differ.)
9. Lu J, Snider JV, Grenache DG. Establishment of reference intervals for soluble ST2 from a United States population. *Clin Chim Acta* 2010;411:1825–6.
10. Dieplinger B, et al. Analytical and clinical evaluation of a novel high-sensitivity assay for measurement of soluble ST2 in human plasma—the Presage ST2 assay. *Clin Chim Acta* 2009;409(1–2):33–40.

## Test Information

2002270

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For specific collection, transport, and testing information, refer to the ARUP website at [www.aruplab.com](http://www.aruplab.com).

For information on test selection, ordering, and interpretation, refer to ARUP Consult® at [www.arupconsult.com](http://www.arupconsult.com).