## Lab Dept: Flow and Immunology

## Test Name: CD4 T-CELL RECENT THYMIC EMIGRANTS (RTE)

### *General Information*

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| **Lab Order Codes:** | CD4RT |
| **Synonyms:** | Acquired Immune Deficiency Syndrome( AIDS), Immune Status, Immunodeficiency Panel, Digeorge Syndrome, Severe Combined Immunodeficiency (SCID) |
| **CPT Codes:** | 86356 – Mononuclear cell antigen, quantitative |
| **Test Includes:** | CD4 Absolute (CD4A); CD4 RTE Percent (CD4RP); CD4 RTE Absolute (CD4RA); and Interpretation (INT52) |

### *Logistics*

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|---|---|
| **Test Indications:** | This assay is useful for evaluating thymic reconstitution in patients following hematopoietic cell transplantation, chemotherapy, immunomodulatory therapy, and immunosuppression. Evaluating thymic recovery in HIV-positive patients on highly active antiretroviral therapy. Evaluating thymic output in patients with DiGeorge syndrome or other cellular immunodeficiencies. Assessing the naïve T-Cell compartment in a variety of immunological contexts (autoimmunity, cancer, immunodeficiency, and transplantation). Identification of thymic remnants post thymectomy for malignant thymoma or as an indicator of relapse of disease (malignant thymoma) or other contexts of thymectomy. |
| **Lab Testing Sections:** | Flow and Immunology - Sendouts |
| **Referred to:** | Mayo Medical Laboratory (MML Test: CD4RT) |
| **Phone Numbers:** | MIN Lab: 612-813-6280<br>STP Lab: 651-220-6550 |
| **Test Availability:** | Monday- Thursday, and by 10AM Friday |
| **Turnaround Time:** | 3 – 4 days |
| **Special Instructions:** | Restricted draw times, See Test Availability |

### *Specimen*

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| **Specimen Type:** | Whole blood |

**Container:** Lavender top (EDTA) tube

**Draw Volume:** 3 mL (Minimum:1.5) mL blood

**Processed Volume:** Same as Draw Volume

**Collection:** Routine venipuncture.

**Special Processing:** Lab Staff:
**Restricted draw times**, specimen must be collected and delivered to lab by Monday-Thursday and by on 10AM Friday. Weekend deliveries are not accepted.

Send specimen in original tube. **Do not centrifuge or aliquot.**

Draw and package specimen as close to shipping time as possible. Ship specimen overnight in an Ambient Mailer Critical Specimens Only (T668) Must be received at MML Monday-Thursday and by 4PM on Friday.

Store and ship at room temperature.

**Patient Preparation:** None

**Sample Rejection:** Mislabeled or unlabeled specimens; gross hemolysis; lipemic specimens

***Interpretive***

**Reference Range:** **Note:** Reference values have not been established for patients that are <30 days of age or >70 years of age.

| Gender | Age | CD4 Absolute (cells/mcL) | CD4 RTE (%) | CD4 RTE Absolute (cells/mcL) |
|---|---|---|---|---|
| **Male** | 1 mo – 17 yrs: | 153 - 1,745 | 19.4 - 60.9 | 50.0 - 926.0 |
| | 18 – 25 yrs: | | 6.4 - 51.0 | |
| | 26 – 55 yrs: | | 6.4 - 41.7 | |
| | > or =56 yrs: | | 6.4 - 27.7 | |
| | 18 – 70 yrs: | 290 - 1,175 | | 42.0 - 399.0 |
| **Female** | 1 mo – 17 yrs: | 582 - 1,630 | 25.8 - 68.0 | 170.0 - 1,007.0 |
| | 18 – 25 yrs: | | 6.4 - 51.0 | |

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|---|---|---|---|---|
| | 26 – 55 yrs: | | 6.4 - 41.7 | |
| | > or =56 yrs: | | 6.4 - 27.7 | |
| | 18 – 70 yrs: | 457 - 1,766 | | 42.0 - 832.0 |

**Interpretation:**
The absence or reduction of CD31+CD4 recent thymic emigrants (RTEs) generally correlates with loss or reduced thymic output and changes in the naive CD4 T-cell compartment, especially in infancy and prepubertal children. The CD4RTE result has to be interpreted more cautiously in adults due to age-related decline in thymic function and correlated with total CD4 T cell count and other relevant immunological data. CD4 RTEs measured along with TREC (TREC/T-Cell Receptor Excision Circles (TREC) Analysis, Blood) provides a comprehensive assessment of thymopoiesis, but should not be used in adults over the sixth decade of life as clinically meaningful information on thymic function is limited in the older population due to a physiological decline in thymic activity.

To evaluate immune reconstitution or recovery of thymopoiesis post-T-cell depletion due to posthematopoietic cell transplant, immunotherapy, or other clinical conditions, it is helpful to systematically (serially) measure CD4RTE, and TREC copies in the appropriate age groups.

**Critical Values:** N/A

**Limitations:** The CD4 recent thymic emigrants (RTE) assay is likely to be most helpful when used along with measurement of T-cell receptor excision circles (TREC / T-Cell Receptor Excision Circles [TREC] Analysis, Blood) for appropriate correlation of thymic output, especially in context of T cell lymphopenia, posthematopoietic cell transplant and other cellular or combined immunodeficiencies.

**Methodology:** Flow Cytometry

**References:** Mayo Medical Laboratories March 2018