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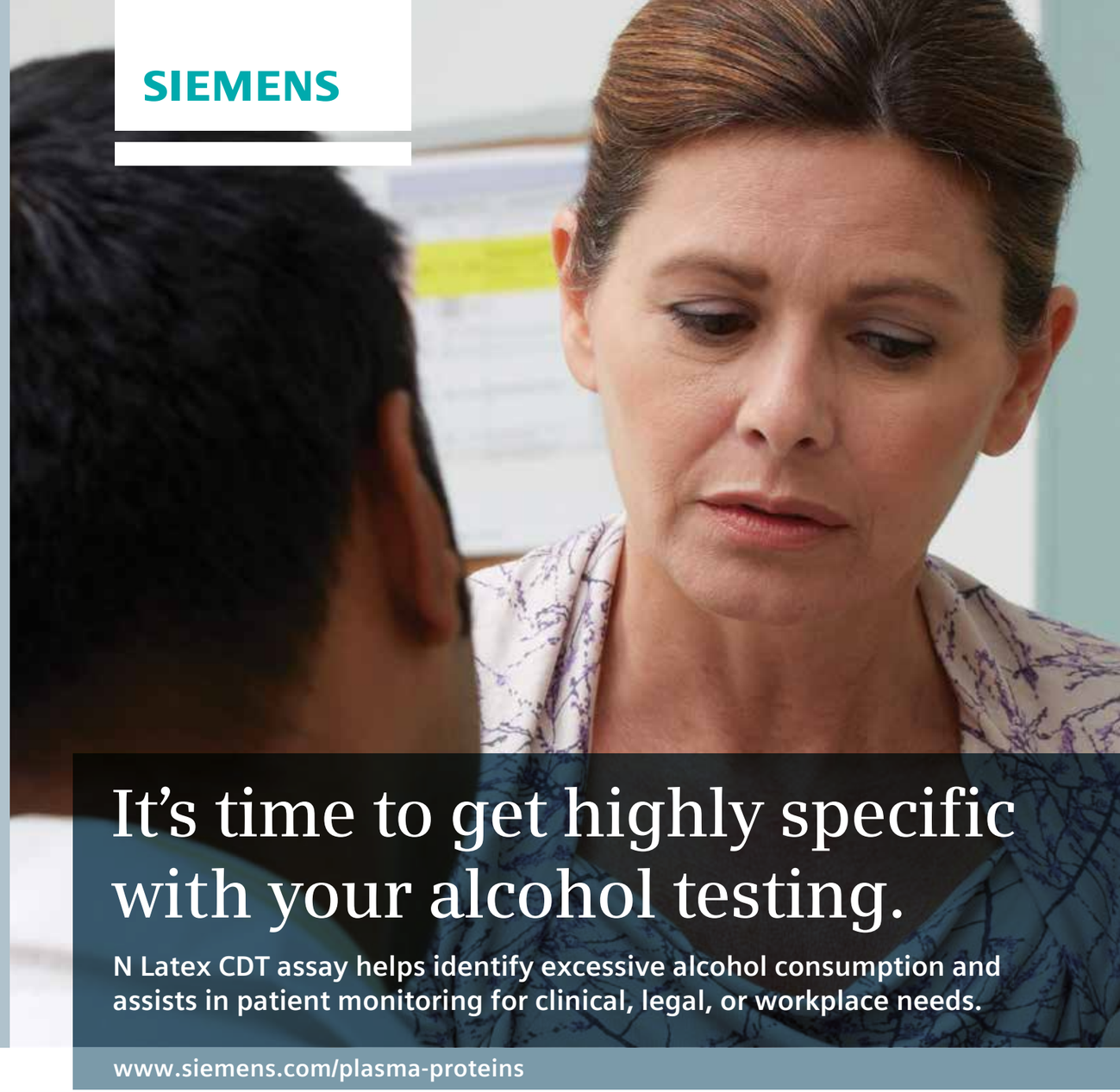


It’s time to get highly specific with your alcohol testing.

N Latex CDT assay helps identify excessive alcohol consumption and assists in patient monitoring for clinical, legal, or workplace needs.

www.siemens.com/plasma-proteins

N Latex CDT assay for detection of potential chronic alcohol abuse:

Get the first highly specific direct immunoassay that does not require pretreatment.

CDT: the Innovative Marker for Detection of Chronic Alcohol Abuse

Carbohydrate-deficient transferrin (CDT) is a variant of the glycoprotein transferrin. Transferrin is an iron-transporting glycoprotein present in high concentrations in serum. It comprises a single polypeptide chain with two N-linked polysaccharide chains. These are branched with terminal sialic acid chains (= tetrasialotransferrin). In human beings, different isoforms of transferrin occur.

Regular alcohol consumption of more than 50–80 g of ethanol per day for at least 2 weeks can result in a changed glycosylation pattern of transferrin, leading to a higher rate of isoforms lacking one or both entire carbohydrate chains.

These isoforms (disialo-, and asialotransferrin) are collectively named carbohydrate-deficient transferrin (Figure 1). After approximately 2–4 weeks of abstinence, CDT concentrations usually return to normal levels.

CDT: the Most Accurate Marker on the Market

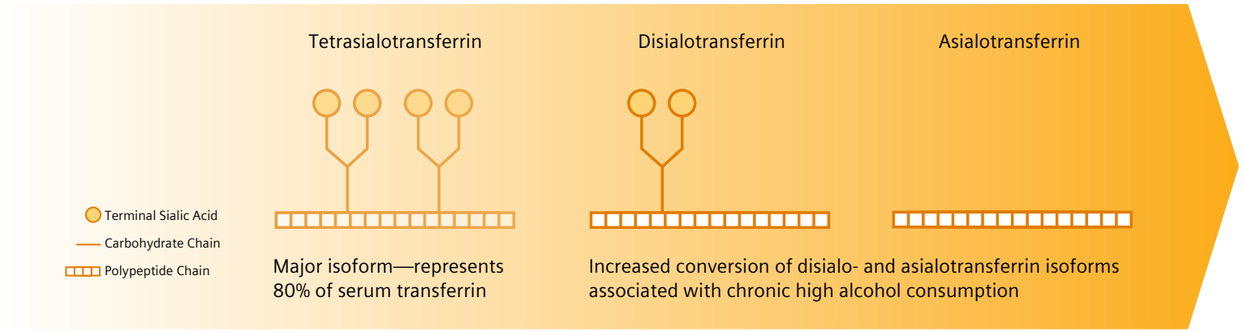
Clinicians require an effective and accurate procedure to identify and manage alcohol abuse.

Gamma-glutamyl transferase (GGT) is a widely accepted marker for alcohol abuse; aspartate aminotransferase (ASAT), alanine aminotransferase (ALAT), and erythrocyte mean corpuscular volume (MCV) are also frequently used.

Compared to other markers, CDT offers superior sensitivity and specificity.[1,2]

- CDT seems not to be affected by liver diseases other than those induced by alcohol abuse (except biliary cirrhosis and chronic active hepatitis).
- CDT is not influenced by common chronic diseases or medication. Research data included hypertension, asthma/bronchitis, diabetes mellitus, adipositas/lipid metabolism disorder, angina pectoris, depression, and disorders of the digestive tract.[3]

Figure 1. Three different isoforms of serum transferrin.



Many Applications of CDT

CDT is regarded as a more specific marker for identifying excessive alcohol consumption and monitoring abstinence during outpatient treatment.[5]

The CDT level increases and decreases with the amount of alcohol consumed. Therefore, many different applications are possible:

Clinical practice

- Differential diagnosis of alcohol-induced versus non-alcohol-induced diseases (e.g., fatty liver, liver cirrhosis, pancreatitis, esophagitis, gastritis, cancer)
- Differential diagnosis of elevated GGT values

Legal applications

- Regranting of driver's license; confirmation of "sober" lifestyle[6]
- Forensic toxicology—exclusion of potentially alcohol-related accidents or deaths

Workplace testing

- Reduction of risk for alcohol-related accidents, trauma, and property damage in safety-sensitive activities

- CDT indicates the effectiveness of alcohol detoxification much earlier than GGT or MCV, for example.
- Ethanol testing detects only very recent intake, because of rapid clearance from the body.
- Medication for treatment of excessive alcohol consumption, such as disulfiram, is reported not to influence the CDT level.[4]

There are only a few causes of false-positive/-negative CDT results: genetic transferrin variants, which influence CDT results, and the extremely rare congenital disorders of glycosylation (CDG) syndrome.

Siemens N Latex CDT direct immunoassay:

Gain a range of benefits for your lab.

Measuring CDT

There are a variety of methods available for the determination of CDT: Mass spectrometry, HPLC, capillary electrophoresis, and isoelectric focusing are all established methods. However N Latex CDT is the first immunoassay for directly quantifying CDT in serum with high specificity through a fully automated procedure.[7]

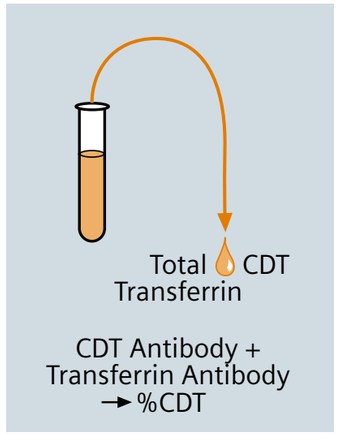
Benefits of the Siemens N Latex CDT Direct Immunoassay

- Highly specific monoclonal antibody that directly detects CDT. Sample splitting by assaying transferrin twice—before and after a time-consuming column separation step—is not necessary (Figure 2).
- No indication of false-positive results due to genetic variants. Trisialotransferrin levels are frequently elevated in other non-alcohol-related liver diseases. However, as it is not a CDT isoform, N Latex CDT results are not affected by trisialotransferrin (Figure 3).
- Reliable results—excellent recovery between labs, systems, and lots (Figure 4).

  With the N Latex CDT assay, CDT can be determined as %CDT compared to total transferrin. This calculation minimizes the influence of transferrin levels, iron status, and mild to moderate limitations of liver function on CDT results. To obtain %CDT values, the transferrin concentration of the sample must be determined as well.

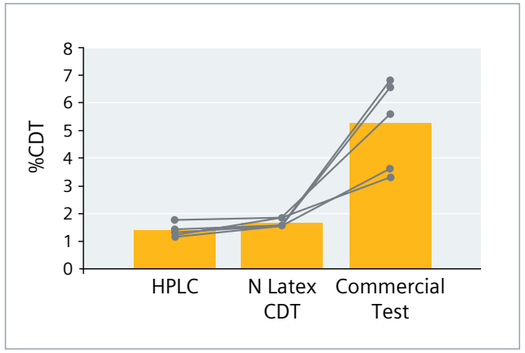
  On BN™ systems, both, CDT as well as Transferrin, can be run simultaneously and present the %CDT as the final result in addition to the mg/L (or selected unit) CDT result.
- Recommended cutoff at 2.5 %CDT.
- No gender-specific reference range.
- CE-marked method.

Figure 2. Direct CDT immunoassay.



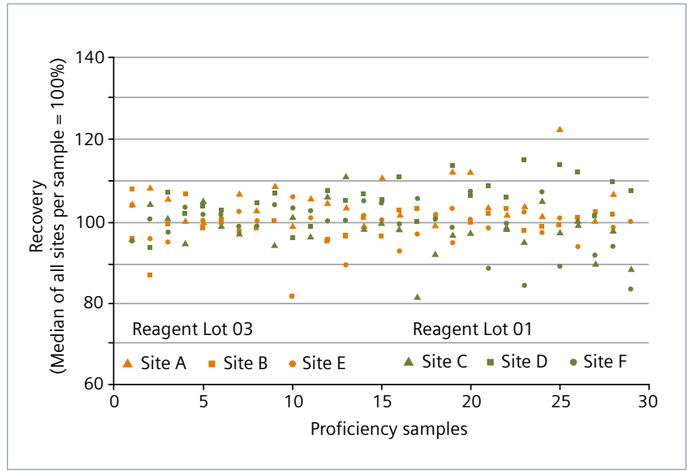
Detect CDT directly with highly specific antibodies. Calculate %CDT by measuring CDT and transferrin simultaneously.

Figure 3. Comparison of %CDT results for genetically determined transferrin variants CD and C2C3 sera (n = 5 samples).[5]



Genetic transferrin variants did not interfere with N Latex CDT.

Figure 4. Proficiency panel recovery results for N Latex CDT (%CDT).



Overall recovery for %CDT (N Latex CDT assay) in six different laboratories using two different lots of reagents and three BN ProSpec® and three BN™ II Systems.

N Latex CDT assay on Siemens BN Systems:

Expand your laboratory's plasma-protein offering by adding CDT to your portfolio.

N Latex CDT Assay, N Antiserum to Human Transferrin, and Siemens BN Systems

More than 3500 installed BN ProSpec and BN II Systems demonstrate Siemens' leading position in nephelometric technology, which is recognized as the gold standard in plasma-protein testing.

- Fully automated CDT testing:
  - No pretreatment
  - No column separation step
  - More specific (relative specificity compared to HPLC; Figure 5)
  - No sample splitting
- Minimized errors due to less manual work
- First results within 20 minutes (total assay time)
- Random access with other protein assays
- Automatic calculation of %CDT from CDT and transferrin results
- Reduced hands-on time

Figure 5. Results of clinical evaluation of N Latex CDT.

n=200		HPLC	
		Positive	Negative
N Latex CDT	Positive	93 (46.5%)	3 (1.5%)
	Negative	7 (3.5%)	97 (48.5%)

Result from external validation of N Latex CDT. Based on a cutoff value of 2.5 %CDT.

Relative specificity and sensitivity based on a cutoff value of 2.5 %CDT for the BN method and 2.0 %CDT for the HPLC (disialo-specific) method.

Relative Sensitivity (%):
Positive (N Latex CDT) /
Positive (HPLC) *100
Relative Sensitivity = 93.0%

Relative Specificity (%):
Negative (N Latex CDT) /
Negative (HPLC) *100
Relative Specificity = 97.0%

Take advantage of a powerful combination:

The N Latex CDT assay is available on the BN II and BN ProSpec Systems.

BN ProSpec System: Dedicated, compact system offering a consolidated menu of specialty and routine plasma-protein testing.

BN II System: Fully automated analyzer providing confidence in results for mid- to high-volume plasma-protein testing.

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