

LIST OF INTERFERENCES: CLINICAL CHEMISTRY

S.No	Test Name	Interference effect
1	Ammonia	Drugs: No interference was found at therapeutic concentrations using common drug panels. Exceptions: Cefoxitin and Intralipid cause artificially high ammonia results at the therapeutic drug level.
		Physiological plasma concentrations of sulfasalazine may lead to false results.
		Temozolomide at therapeutic concentrations may lead to erroneous results.
		Effects of concentrations exceeding these recommendations have not been characterized.
2	Albumin	In very rare cases, gammopathy, IgM (Waldenström's macroglobulinemia), may cause unreliable results
		Drugs: No interference was found at therapeutic concentrations using common drug panels.
		In very rare cases, gammopathy, IgM (Waldenström's macroglobulinemia), may cause unreliable results.
		Colorimetric methods used for the determination of Albumin may lead to falsely elevated test results in patients suffering from renal failure or insufficiency due to interference with other proteins. Immunoturbidimetric methods are less affected
3	Amylase	Drugs: No interference was found at therapeutic concentrations using common drug panels.
		In very rare cases, gammopathy, IgM (Waldenström's macroglobulinemia), may cause unreliable results.
		Colorimetric methods used for the determination of Albumin may lead to falsely elevated test results in patients suffering from renal failure or insufficiency due to interference with other proteins. Immunoturbidimetric methods are less affected
4	A1AT	Anticoagulants: Interference was found with citrate, fluoride, and EDTA
		Glucose: No significant interference from glucose up to a concentration of 111 mmol/L (2000 mg/dL). Approximately 10 % higher recovery was found at glucose concentrations of 250 mmol/L (4500 mg/dL).
		Ascorbic acid: No significant interference from ascorbic acid up to a concentration of 100 mg/dL.
		Drugs: No interference was found at therapeutic concentrations using common drug panels.
5	Alkaline Phosphate	In very rare cases, gammopathy, IgM (Waldenström's macroglobulinemia), may cause unreliable results
		Drugs: No interference was found at therapeutic concentrations using common drug panels.
6	ALT (SGPT)	Drugs: No interference was found at therapeutic concentrations using common drug panels.
		In very rare cases, gammopathy, in particular type IgM (Waldenström's macroglobulinemia), may cause unreliable results
7	AST(SGOT)	Drugs: No interference was found at therapeutic concentrations using common drug panels.
		In very rare cases, gammopathy, in particular type IgM (Waldenström's macroglobulinemia), may cause unreliable results
8	BUN	Ammonium ions may cause erroneously elevated results.
		Drugs: No interference was found at therapeutic concentrations using common drug panels
9	Bicarbonate	In very rare cases, gammopathy, in particular type IgM (Waldenström's macroglobulinemia), may cause unreliable results
		Immunoglobulins: No significant interference from immunoglobulins up to a concentration of 35 g/L (233.5 µmol/L)
		Drugs: No interference was found at therapeutic concentrations using common drug panels
10	Calcium	Magnesium: No significant interference from magnesium up to a concentration of 15 mmol/L (36.5 mg/dL).
		Drugs: No interference was found at therapeutic concentrations using common drug panels.
		The interference of intravenously administered gadolinium containing MRI (magnetic resonance imaging) contrast media was tested (Omniscan®,Optimark®) but no interference was found at the therapeutic concentration. Interferences at higher concentrations were observed.
		(magnetic resonance imaging) contrast media was tested (Omniscan®,Optimark®) but no interference was found at the therapeutic concentration. Interferences at higher concentrations were observed.
11	Cholesterol	In very rare cases, gammopathy, in particular type IgM (Waldenström's macroglobulinemia), may cause unreliable results
		Drugs: No interference was found at therapeutic concentrations using common drug panels
		Acetaminophen intoxications are frequently treated with N-acetylcysteine. N-Acetylcysteine at the therapeutic concentration when used as an antidote and the acetaminophen metabolite N-acetyl-p-benzoquinone imine (NAPQI) independently may cause falsely low results.
		Venipuncture should be performed prior to the administration of metamizole. Venipuncture immediately after or during the administration of metamizole may lead to falsely low results.
12	CPK	In very rare cases, gammopathy, in particular type IgM (Waldenström's macroglobulinemia), may cause unreliable results
		The following drugs have been tested and caused no significant interference when added to aliquots of pooled normal human serum up to the indicated concentration. Falsely high chloride values have been reported from patients receiving perchlorate medication. This is due to an interference of perchlorate ions with chloride ISE determinations
13	Chloride	Acetaminophen (paracetamol) 200 mg/L , Acetylcysteine 1660 mg/L , Acetylsalicylic acid 1000 mg/L , Ampicillin-Na 1000 mg/L , Ascorbic acid 300 mg/L , Cefoxitin 2500 mg/L , Cyclosporin 5 mg/L , Doxycycline 50 mg/L , Heparin 5000 IU/L , Ibuprofen 500 mg/L , Intralipid 10000 mg/L , L-Dopa 20 mg/L , Methyldopa 20 mg/L , Metronidazol 200 mg/L , Phenylbutazone 400 mg/L , Rifampicin 60 mg/L , Theophylline 100 mg/L.
		Pyruvate: No significant interference from pyruvate up to a concentration of 0.3 mmol/L (2.6 mg/dL).
		Glucose: No significant interference from glucose up to a concentration of 25 mmol/L (450 mg/dL).
		Ascorbic acid: No significant interference from ascorbic acid up to a concentration of 5 mmol/L (88 mg/dL).
14	Creatinine	Drugs: No interference was found at therapeutic concentrations using common drug panels.
		Exception: Antibiotics containing cephalosporin lead to significant false-positive values , Cefoxitin causes artificially high creatinine results, Cyanokit (Hydroxocobalamin) may cause interference with results.
		The presence of ketone bodies can cause artificially high results in serum and plasma
		In very rare cases, gammopathy, in particular type IgM (Waldenström's macroglobulinemia), may cause unreliable results
15	C-RP	Rheumatoid factors: No significant interference from rheumatoid factors up to a concentration of 1200 IU/mL.
		High dose hook-effect: No false result occurs up to a CRP concentration of 1200 mg/L.
		Immunoglobulins: No significant interference from immunoglobulins up to a concentration of 50 g/L (334 µmol/L) (simulated by human immunoglobulin G).
		Drugs: No interference was found at therapeutic concentrations using common drug panels.
16	Direct Bilirubin	Significantly decreased CRP values may be obtained from samples taken from patients who have been treated with carboxypenicillins.
		In very rare cases, gammopathy, in particular type IgM (Waldenström's macroglobulinemia), may cause unreliable results
		In very rare cases, gammopathy, in particular type IgM (Waldenström's macroglobulinemia), may cause unreliable results
		Drugs: No interference was found at therapeutic concentrations using common drug panels xception: Phenylbutazone causes artificially low bilirubin results.
17	Glucose	Drugs: No interference was found at therapeutic concentrations using common drug panels.

		In very rare cases, gammopathy, in particular type IgM (Waldenström's macroglobulinemia), may cause unreliable results
18	Haptoglobin	Rheumatoid factors: No significant interference from rheumatoid factors up to a concentration of 1200 IU/mL. High-dose hook effect: No false result occurs up to a haptoglobin concentration of 12 g/L. Drugs: No interference was found at therapeutic concentrations using common drug panels. In very rare cases, gammopathy, in particular type IgM (Waldenström's macroglobulinemia), may cause unreliable results
19	HbA1c	Abnormal haemoglobins might affect the half life of the red cells or the in vivo glycation rates. In these cases correct results do not reflect the same level of glycaemic control that would be expected in patients with normal haemoglobin. Whenever it is suspected that the presence of an Hb variant (e.g. HbS, HbC or HbS) affects the correlation between the HbA1c value and glycaemic control, HbA1c must not be used for the diagnosis of diabetes mellitus Any cause of shortened erythrocyte survival or decrease in mean erythrocyte age will reduce exposure of erythrocytes to glucose with a consequent decrease in mmol/mol HbA1c values (IFCC) and % HbA1c values (DCCT/NGSP). Causes of shortened erythrocyte lifetime might be haemolytic anaemia or other haemolytic diseases, homozygous sickle cell trait, pregnancy, recent significant or chronic blood loss, etc. Similarly, recent blood transfusions can alter the mmol/mol HbA1c values (IFCC) and % HbA1c values (DCCT/NGSP). When interpreting the HbA1c results from patients with these conditions, HbA1c must not be used for the diagnosis of diabetes mellitus in the presence of such conditions Glycated HbF is not detected by the assay as it does not contain the glycated β-chain that characterizes HbA1c. However, HbF is measured in the total Hb assay and as a consequence, specimens containing high amounts of HbF (> 7%) may result in lower than expected mmol/mol HbA1c values (IFCC) and % HbA1c values (DCCT/NGSP) In very rare cases of rapidly evolving type 1 diabetes the increase of the HbA1c values might be delayed compared to the acute increase in glucose concentrations. Glycemia: No significant interference from glucose up to a concentration of 55.5 mmol/L (1000 mg/dL). A fasting sample is not required Rheumatoid factors: No significant interference from rheumatoid factors up to a concentration of 750 IU/mL. Drugs: No interference was found at therapeutic concentrations using common drug panels
20	HDL Chol	Elevated concentrations of free fatty acids and denatured proteins may cause falsely elevated HDL-cholesterol results. Ascorbic acid: No significant interference from ascorbic acid up to a concentration of 2.84 mmol/L (50 mg/dL) Abnormal liver function affects lipid metabolism; consequently, HDL and LDL results are of limited diagnostic value. In some patients with abnormal liver function, the HDL-cholesterol result may significantly differ from the DCM (designated comparison method) result due to the presence of lipoproteins with abnormal lipid distribution. Drugs: No interference was found at therapeutic concentrations using common drug panels
21	IGA /IGG/ IGM	Rheumatoid factors: No significant interference from rheumatoid factors up to a concentration of 1200 IU/mL. High dose hook-effect: No false result up to an IgA concentration of 100 g/L occurs due to an antigen excess within polyclonal specimens. There is no cross-reaction between IgA and IgG or IgM under the assay conditions. Drugs: No interference was found at therapeutic concentrations using common drug panels.
22	IRON	Drugs: No interference was found at therapeutic concentrations using common drug panels. In patients treated with iron supplements or metal-binding drugs, the drug-bound iron may not properly react in the test, resulting in artificially low values In the presence of high ferritin concentrations > 1200 µg/L the assumption that serum iron is almost completely bound to transferrin is not valid anymore. Therefore, such iron results should not be used to calculate Total Iron Binding Capacity (TIBC) or percent transferrin saturation (% SAT)
23	LACTIC ACID	In very rare cases, gammopathy, in particular type IgM (Waldenström's macroglobulinemia), may cause unreliable results Drugs: No interference was found at therapeutic concentrations using common drug panels. Venipuncture should be performed prior to the administration of metimazole. Venipuncture immediately after or during the administration of metimazole may lead to falsely low results. A significant interference may occur at any plasma metimazole concentration. Exception: Calcium dobesilate causes artificially low lactate results Glycolate, a metabolite of ethylene glycol, causes a positive interference which is variable from lot to lot of reagent. Dicyclic (Etamsylate) at therapeutic concentrations may lead to false-low results. Acetaminophen intoxications are frequently treated with N-acetylcysteine. N-acetylcysteine at a plasma concentration above 1497 mg/L and the acetaminophen metabolite N-acetyl-p-benzoquinone imine (NAPQI) independently may cause falsely low results. In very rare cases, gammopathy, in particular type IgM (Waldenström's macroglobulinemia), may cause unreliable results.
24	LDH	Drugs: No interference was found at therapeutic concentrations using common drug panels Contamination with erythrocytes will elevate results, because the analyte level in erythrocytes is higher than in normal sera. The level of interference may be variable depending on the content of analyte in the lysed erythrocytes In very rare cases, gammopathy, in particular type IgM (Waldenström's macroglobulinemia), may cause unreliable results
25	LDL	Drugs: No interference was found at therapeutic concentrations using common drug panels. Nicotinic acid (Niacin), statins (Simvastatin) and fibrates (Clofibrate) tested at therapeutic concentration ranges did not interfere. Acetaminophen intoxications are frequently treated with N-acetylcysteine. N-acetylcysteine at the therapeutic concentration when used as an antidote and the acetaminophen metabolite N-acetyl-p-benzoquinone imine (NAPQI) independently may cause falsely low LDL-C results Venipuncture should be performed prior to the administration of metimazole. Venipuncture immediately after or during the administration of metimazole may lead to falsely low results Ascorbic acid: No significant interference from ascorbic acid up to a concentration of 28.4 mmol/L (500 mg/dL). Abnormal liver function affects lipid metabolism; consequently HDL and LDL results are of limited diagnostic value. In some patients with abnormal liver function, the LDL-cholesterol result is significantly negatively biased versus beta quantification results. EDTA plasma may cause decreased values compared to serum. In very rare cases, gammopathy, in particular type IgM (Waldenström's macroglobulinemia), may cause unreliable results
26	LIPASE	Drugs: No interference was found at therapeutic concentrations using common drug panels
27	MAGNESIUM	In very rare cases, gammopathy, in particular type IgM (Waldenström's macroglobulinemia), may cause unreliable results. Drugs: No interference was found at therapeutic concentrations using common drug panels
28	MICROALBUMIN	Rheumatoid factors: No significant interference up to a concentration of 1200 IU/ML Drugs: No interference was found at therapeutic concentrations using common drug panels In very rare cases, gammopathy, in particular type IgM (Waldenström's macroglobulinemia), may cause unreliable results.
29	PHOSPHORUS	Drugs: No interference was found at therapeutic concentrations using common drug panels Exception: Phospholipids contained in liposomal drug formulations (eg AmBisome) may be hydrolyzed in the test due to the acidic reaction Ph and thus lead to elevated phosphate results. In very rare cases, gammopathy, in particular type IgM (Waldenström's macroglobulinemia), may cause unreliable results.
30	PROTEIN (TOTAL)	Dextran: No significant interference from dextran up to a concentration of 30 mg/ML Drugs: No interference was found at therapeutic concentrations using common drug panels In very rare cases, gammopathy, in particular type IgM (Waldenström's macroglobulinemia), may cause unreliable results.

31	POTASSIUM	The following drugs have been tested and caused no significant interference when added to aliquots of pooled normal human serum up to the indicated concentration. Falsely high chloride values have been reported from patients receiving perchlorate medication. This is due to an interference of perchlorate ions with chloride ISE determinations Acetaminophen (paracetamol) 200 mg/L , Acetylcysteine 1660 mg/L , Acetylsalicylic acid 1000 mg/L , Ampicillin-Na 1000 mg/L , Ascorbic acid 300 mg/L , Cefoxitin 2500 mg/L , Cyclosporin 5 mg/L , Doxycycline 50 mg/L, Heparin 5000 IU/L , Ibuprofen 500 mg/L , Intralipid 10000 mg/L , L-Dopa 20 mg/L , Methyldopa 20 mg/L , Metronidazol 200 mg/L , Phenylbutazone 400 mg/L , Rifampicin 60 mg/L , Theophylline 100 mg/L.
32	SODIUM	The following drugs have been tested and caused no significant interference when added to aliquots of pooled normal human serum up to the indicated concentration. Falsely high chloride values have been reported from patients receiving perchlorate medication. This is due to an interference of perchlorate ions with chloride ISE determinations Acetaminophen (paracetamol) 200 mg/L , Acetylcysteine 1660 mg/L , Acetylsalicylic acid 1000 mg/L , Ampicillin-Na 1000 mg/L , Ascorbic acid 300 mg/L , Cefoxitin 2500 mg/L , Cyclosporin 5 mg/L , Doxycycline 50 mg/L, Heparin 5000 IU/L , Ibuprofen 500 mg/L , Intralipid 10000 mg/L , L-Dopa 20 mg/L , Methyldopa 20 mg/L , Metronidazol 200 mg/L , Phenylbutazone 400 mg/L , Rifampicin 60 mg/L , Theophylline 100 mg/L.
33	RF	High dose hook-effect: Using the prozone check automatically performed by the analyzer, no false result without a flag was observed up to an RF concentration of 6000 IU/m L Drugs: No interference was found at therapeutic concentrations using common drug panels In very rare cases, gammopathy, in particular type IgM (Waldenström's macroglobulinemia), may cause unreliable results.
34	Total Bile Acid	Bile Acid concentrations of 10.0 µmol/l and 100 µmol/l and found not to interfere with Ascorbic Acid 3mg/dl & Intralipid 500 mg/dl Drugs: No interference was found at therapeutic concentrations using common drug panels. Indican: No significant interference from indican up to a concentration of 0.12 mmol/L (3 mg/dL). Cyanokit (Hydroxocobalamin) may cause falsely low results. Samples containing indocyanine green must not be measured. Results from certain multiple myeloma patients may show a positive bias in recovery. Not all multiple myeloma patients show the bias and the severity of the bias may vary between patients. Immunoglobulins: No significant interference from immunoglobulins up to a concentration of 28 g/L (187 µmol/L) (simulated by human immunoglobulin G) In very rare cases, gammopathy, in particular type IgM (Waldenström's macroglobulinemia), may cause unreliable results
35	Total Bilirubin	Prozone Check: The flag > Kin is an indicator for extremely high triglyceride concentrations in the sample. False normal results are due to oxygen depletion during assay reaction. Endogenous unesterified glycerol in the sample will falsely elevate serum triglycerides. Dicynone (Etamsylate) at therapeutic concentrations may lead to false-low results Drugs: No interference was found at therapeutic concentrations using common drug panels. Exception: Ascorbic acid and calcium dobesilate cause artificially low triglyceride results. Intralipid is directly measured as analyte in this assay and leads to high triglyceride results. Acetaminophen intoxications are frequently treated with N-Acetylcysteine. N-Acetylcysteine at a plasma concentration above 166 mg/L and the Acetaminophen metabolite N-acetyl-p-benzoquinone imine (NAPQI) N-Acetylcysteine at a plasma concentration above 166 mg/L and the independently may cause falsely low results Venipuncture should be performed prior to the administration of Metamizole. Venipuncture immediately after or during the administration of Metamizole may lead to falsely low results A significant interference may occur at plasma Metamizole concentrations above 0.05 mg/ml In very rare cases, gammopathy, in particular type IgM (Waldenström's macroglobulinemia), may cause unreliable results Urea: No significant interference from urea up to a concentration of 1300 mmol/L (7809 mg/dL). Drugs: No interference was found at therapeutic concentrations using common drug panels.
36	TRIGLYCERIDES	Exception: Levodopa, methyldopa and Na2-cefoxitin cause artificially high total protein results and calcium dobesilate causes artificially low protein results. Other: Patient samples containing > 8 g/L of organically bound iodine from Radiopaque media (e.g. Hexabrix) may have falsely elevated results. High levels of homogentisic acid can be found in urine of patients with the rare genetic disorder Alkaptonuria. Homogentisic acid in urine samples at concentrations > 0.6 mmol/L can cause false results The administration of gelatin-based plasma replacements can lead to increased urine protein values Drugs: No interference was found at therapeutic concentrations using common drug panels. Exception: Oxytetracycline causes artificially high UIBC values at the tested drug level. Pathologically high levels of albumin (7 g/dL) decrease the apparent UIBC value significantly. If the patient's serum iron exceeds the binding capacity of the transferrin, a negative UIBC value will result. In patients treated with iron supplements or metal-binding drugs, the drug-bound iron may not properly react in the test, resulting in falsely low values. The physiological function of deferoxamine containing drugs is to bind iron to facilitate its elimination from the body. Therefore any deferoxamine concentration interferes with the UIBC assay. In the presence of high ferritin concentrations > 1200 µg/L the assumption that serum iron is almost completely bound to transferrin is not valid anymore. Therefore, such iron results should not be used to calculate Total Iron Binding Capacity (TIBC) or percent transferrin saturation (% SAT) In very rare cases, gammopathy, in particular type IgM (Waldenström's macroglobulinemia), may cause unreliable results.
37	PROTEIN CSF/URINE	Ascorbic acid: No significant interference from ascorbic acid up to a concentration of 0.17 mmol/L (3 mg/dL). Drugs: No interference was found at therapeutic concentrations using common drug panels Exceptions: Calcium dobesilate causes artificially low uric acid results. Uricase reacts specifically with uric acid. Other purine derivatives can inhibit the uric acid reaction. Dicynone (Etamsylate) at therapeutic concentrations may lead to false-low results. Acetaminophen intoxications are frequently treated with N-acetylcysteine. N-Acetylcysteine at the therapeutic concentration when used as an antidote and the acetaminophen metabolite N-acetyl-p-benzoquinone imine (NAPQI) independently may cause falsely low results Venipuncture should be performed prior to the administration of Metamizole. Venipuncture immediately after or during the administration of Metamizole may lead to falsely low results. In very rare cases, gammopathy, in particular type IgM (Waldenström's macroglobulinemia), may cause unreliable results
38	UIBC	Rheumatoid factors: No significant interference from rheumatoid factors up to a concentration of 1200 IU/mL. High-dose hook effect: No false result occurs up to a C3c concentration of 12.5 g/L Drugs: No interference was found at therapeutic concentrations using common drug panels. In very rare cases, gammopathy, in particular type IgM (Waldenström's macroglobulinemia), may cause unreliable results.
39	URIC ACID	Rheumatoid factors: No significant interference from rheumatoid factors up to a concentration of 600 IU/mL. High dose hook-effect: No false result occurs up to a C4 concentration of 5 g/L (25 µmol/L, 500 mg/dL). Drugs: No interference was found at therapeutic concentrations using common drug panels. In very rare cases, gammopathy, in particular type IgM (Waldenström's macroglobulinemia), may cause unreliable results.
40	C3	
41	C4	