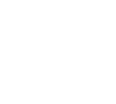
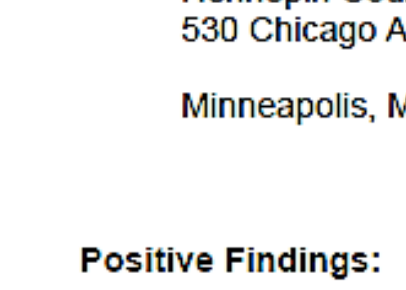


## George Floyd: The Toxicology Report



## Toxicology Report on George Floyd (prepared 5/31/2020 for the Hennepin County Medical Examiner)



NMS Labs

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Robert A. Middleberg, PhD, F-ABFT, DABCC-TC, Laboratory

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## Toxicology Report

Report issued: 05/31/2020 18:44

To: **148889**  
Hennepin County Medical Examiner  
530 Chicago Avenue  
Minneapolis, MN 55415

**Patient Name** FLOYD, GEORGE  
**Patient ID** 2020-3700  
**Chain** NMSCP59310  
**Age** 46 DOB 10/14/1973  
**Gender** Male  
**Workorder** 20159963

Page 1 of 7

## Positive Findings:

Compound	Result	Units	Matrix Source
Caffeine	Positive	mcg/mL	001 - Hospital Blood
Cotinine	Positive	ng/mL	001 - Hospital Blood
4-ANPP	0.65	ng/mL	003 - Hospital Blood
11-Hydroxy Delta-9 THC	1.2	ng/mL	001 - Hospital Blood
Delta-9 Carboxy THC	1.3	ng/mL	001 - Hospital Blood
Delta-9 THC	2.9	ng/mL	001 - Hospital Blood
Methamphetamine	19	ng/mL	001 - Hospital Blood
Fentanyl	11	ng/mL	001 - Hospital Blood
Norfentanyl	5.6	ng/mL	001 - Hospital Blood
Cannabinoids	Presump Pos	ng/mL	012 - Urine
Amphetamines	Presump Pos	ng/mL	012 - Urine
Fentanyl / Metabolite	Presump Pos	ng/mL	012 - Urine
Morphine - Free	86	ng/mL	012 - Urine

See Detailed Findings section for additional information

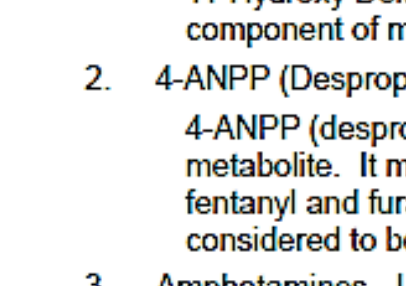
## Testing Requested:

Analysis Code	Description
850UJ	Postmortem, Urine Screen Add-on (6-MAM Quantification only)
9096B	Alcohol Screen, Blood (Forensic)
8210B	Novel Psychoactive Substances (NPS) Screen 2, Blood
8525B	Postmortem, Expanded, Blood (Forensic)
8756B	Novel Psychoactive Substances (NPS) Screen 1, Blood

## Specimens Received:

ID	Tube/Container	Volume/ Mass	Collection Date/Time	Matrix Source	Miscellaneous Information
001	Lavender Vial	2.6 mL	05/25/2020 21:00	Hospital Blood	
002	Gray Vial	0.6 mL	05/25/2020 21:00	Hospital Blood	
003	Lavender Vial	5.75 mL	05/25/2020 21:00	Hospital Blood	
004	Light Blue Vial	2.5 mL	05/25/2020 21:00	Hospital Blood	
005	Green Vial	1.3 mL	05/25/2020 21:00	Hospital Blood	
006	Red Vial	0.75 mL	05/25/2020 21:00	Hospital Serum or Plasma	
007	Gray Top Tube	8.8 mL	05/26/2020 12:20	Femoral Blood	
008	Gray Top Tube	8.8 mL	05/26/2020 12:20	Femoral Blood	
009	Gray Top Tube	8.8 mL	05/26/2020 12:20	Femoral Blood	

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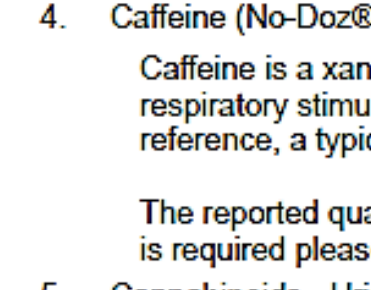
**Workorder** 20159963  
**Chain** NMSCP59310  
**Patient ID** 2020-3700

Page 2 of 7

ID	Tube/Container	Volume/ Mass	Collection Date/Time	Matrix Source	Miscellaneous Information
010	Gray Top Tube	8.8 mL	05/26/2020 12:20	Femoral Blood	
011	Gray Vial	3.3 mL	05/26/2020 12:20	Femoral Blood	
012	Yellow Vial	7.75 mL	05/26/2020 12:20	Urine	
013	Yellow Vial	7.75 mL	05/26/2020 12:20	Urine	

All sample volumes/weights are approximations.

Specimens received on 05/28/2020.



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**Workorder** 20159963  
**Chain** NMSCP59310  
**Patient ID** 2020-3700

Page 3 of 7

## Detailed Findings:

Analysis and Comments	Result	Units	Rpt. Limit	Specimen Source	Analysis By
Caffeine	Positive	mcg/mL	0.20	001 - Hospital Blood	LC/TOF-MS
Cotinine	Positive	ng/mL	200	001 - Hospital Blood	LC/TOF-MS
4-ANPP	0.65	ng/mL	0.10	003 - Hospital Blood	LC-MS/MS
11-Hydroxy Delta-9 THC	1.2	ng/mL	1.0	001 - Hospital Blood	LC-MS/MS
Delta-9 Carboxy THC	4.2	ng/mL	5.0	001 - Hospital Blood	LC-MS/MS
Delta-9 THC	2.9	ng/mL	0.50	001 - Hospital Blood	LC-MS/MS
Methamphetamine	19	ng/mL	5.0	001 - Hospital Blood	LC-MS/MS
Fentanyl	11	ng/mL	0.10	001 - Hospital Blood	LC-MS/MS
Norfentanyl	5.6	ng/mL	0.20	001 - Hospital Blood	LC-MS/MS
Cannabinoids	Presump Pos	ng/mL	50	012 - Urine	EIA

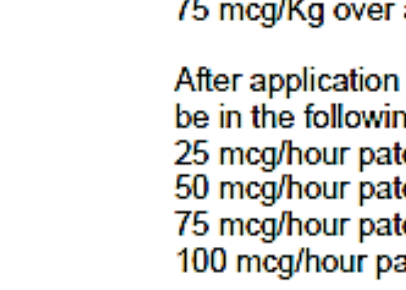
This test is an unconfirmed screen. Confirmation by a more definitive technique such as GC/MS is recommended.

Amphetamines - Urine

Amphetamines are a class of central nervous system stimulant drugs, with some therapeutic uses, and a high potential for abuse.

This result derives from a presumptive test, which may be subject to cross-reactivity with non-amphetamine related compounds. A second test is necessary to confirm the presence of amphetamine related compounds.

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**Workorder** 20159963  
**Chain** NMSCP59310  
**Patient ID** 2020-3700

Page 4 of 7

## Reference Comments:

- 11-Hydroxy Delta-9 THC (Active Metabolite) - Hospital Blood:  
11-Hydroxy Delta-9 THC is an active intermediate metabolite of tetrahydrocannabinol (THC) the active component of marijuana. Usual peak levels: Less than 10% of THC levels after smoking.
- 4-ANPP (Despropionyl fentanyl) - Hospital Blood:  
4-ANPP (despropionyl fentanyl) is a precursor chemical used in the production of fentanyl and is also a fentanyl metabolite. It may be used in the production of other related compounds such as acetyl fentanyl, butyl fentanyl and furanyl fentanyl and may be a metabolite of these. And other fentanyl-related compounds. It is considered to be pharmacologically weak.
- Amphetamines - Urine:  
Amphetamines are a class of central nervous system stimulant drugs, with some therapeutic uses, and a high potential for abuse.  
This result derives from a presumptive test, which may be subject to cross-reactivity with non-amphetamine related compounds. A second test is necessary to confirm the presence of amphetamine related compounds.
- Caffeine (No Doxyl) - Hospital Blood:  
Caffeine is a xanthine-derived central nervous system stimulant. It also produces diuresis and cardiac and respiratory stimulation. It can be readily found in such items as coffee, tea, soft drinks and chocolate. As a reference, a typical cup of coffee or tea contains between 40 to 100 mg caffeine.  
The reported qualitative result for this substance was based upon a single analysis only. If confirmation testing is required please contact the laboratory.
- Cannabinoids - Urine:  
Cannabinoids are chemical compounds derived from the plant Cannabis sativa (marijuana), including active components, chemical congeners and metabolites. Delta-9-Tetrahydrocannabinol (THC) is the principal active component.  
This result derives from a presumptive test, which may be subject to cross-reactivity with non-cannabinoid related compounds. A second test is necessary to confirm the presence of cannabinoid related compounds.
- Cotinine (Nicotine Metabolite) - Hospital Blood:  
Cotinine is a metabolite of nicotine and may be encountered in the fluids and tissues of an individual as a result of tobacco exposure.  
Anabasine is a natural product occurring in tobacco, but not in pharmaceutical nicotine and a separate test for anabasine in urine can be used to distinguish tobacco from pharmaceutical nicotine use.  
The reported qualitative result for this substance was based upon a single analysis only. If confirmation testing is required please contact the laboratory.
- Delta-9 Carboxy THC (Inactive Metabolite) - Hospital Blood:  
Delta-9-THC is the principle psychoactive ingredient of marijuana/hashish. Delta-9-carboxy-THC (THCC) is the inactive metabolite of THC. The usual peak concentrations in serum for 1.75% or 3.55% THC marijuana cigarettes are 10 - 100 ng/mL, attained 2 to 240 minutes after beginning smoking, with a slow decline thereafter. The ratio of whole blood concentration to plasma concentration is unknown for this analyte. THCC may be detected for up to one day or more in blood. Both delta-9-THC and THCC may be present substantially longer in chronic users. THCC is usually not detectable after passive inhalation.
- Delta-9 THC (Active Ingredient of Marijuana) - Hospital Blood:  
Marijuana is a DEA Schedule I hallucinogen. Pharmacologically, it has depressant and reality distorting effects. Collectively, the chemical compounds that comprise marijuana are known as Cannabinoids.  
Delta-9-THC is the principle psychoactive ingredient of marijuana/hashish. It rapidly leaves the blood, even during smoking, falling to below detectable levels within several hours. Delta-9-carboxy-THC (THCC) is the inactive metabolite of THC and may be detected for up to one day or more in blood. Both delta-9-THC and THCC may be present substantially longer in chronic users.  
THC concentrations in blood are usually about nine-half of serum/plasma concentrations. Usual peak levels in serum for 1.75% or 3.55% THC marijuana cigarettes: 50 - 270 ng/mL at 6 to 9 minutes after beginning smoking, decreasing to less than 5 ng/mL by 2 hrs.
- Fentanyl (Duragesic® Sublingually) - Hospital Blood:  
Fentanyl is a DEA Schedule II synthetic morphine substitute anesthetic/analgesic. It is reported to be 80 to 200 times as potent as morphine and has a rapid onset of action as well as addictive properties.  
It is reported that patients lost consciousness at mean plasma levels of fentanyl of 34 ng/mL when infused with 75 mcg/kg over a 15 min period; peak plasma levels averaged 50 ng/mL.  
After application of a fentanyl transdermal preparation (patch), serum fentanyl concentrations are reported to be in the following ranges within 24 hours:  
25 mcg/hour patch: 0.3 - 1.2 ng/mL  
50 mcg/hour patch: 0.6 - 1.8 ng/mL  
75 mcg/hour patch: 1.1 - 2.6 ng/mL  
100 mcg/hour patch: 1.9 - 3.8 ng/mL.

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**Workorder** 20159963  
**Chain** NMSCP59310  
**Patient ID** 2020-3700

Page 5 of 7

## Reference Comments:

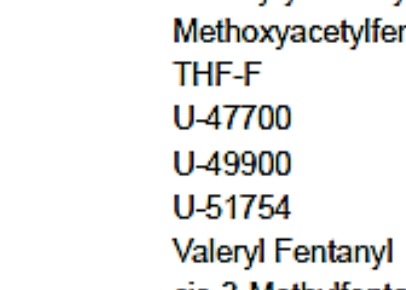
- Following removal of the patch, serum fentanyl concentrations are reported to decrease with a mean elimination half-life of 17 hours (range, 13 to 22 hours).
- The mean peak plasma serum fentanyl concentration in adults given an 800 mcg oral transmucosal fentanyl preparation over 15 minutes is reported at 2.1 ng/mL (range, 1.4 - 3.0 ng/mL) at approximately 0.4 hours.
- Signs associated with fentanyl toxicity include severe respiratory depression, seizures, hypotension, coma and death. In fatalities from fentanyl, blood concentrations are variable and have been reported as low as 3 ng/mL.
- Substance(s) known to interfere with the identity and/or quantity of the reported result: 4-methylphenethyl acetyl fentanyl
10. Fentanyl / Metabolite - Urine:  
Fentanyl is a DEA Schedule II synthetic morphine substitute anesthetic/analgesic. It is reported to be 80 to 200 times as potent as morphine and has a rapid onset of action as well as addictive properties.  
This result derives from a presumptive test, which may be subject to cross-reactivity with non-fentanyl related compounds. A second test is necessary to confirm the presence of fentanyl related compounds.
11. Methamphetamine - Hospital Blood:  
d-Methamphetamine is a DEA schedule II stimulant drug capable of causing hallucinations, aggressive behavior and irrational reactions. Chemically, there are two forms (isomers) of methamphetamine: l- and d-methamphetamine. The l-isomer is used in non-prescription inhalers as a decongestant and has weak CNS-stimulatory activity. The d-isomer has been used therapeutically as an anorectic agent in the treatment of obesity and has potent CNS-, cardiac- and circulatory-stimulatory activity. Amphetamine and nonphedrine (phenylpropionylamine) are metabolites of methamphetamine. d-Methamphetamine is an abused substance because of its stimulatory effects and is also addictive.  
A peak blood concentration of methamphetamine of 20 ng/mL was reported at 2.5 hr after an oral dosage of 12.5 mg. Blood levels of 200 - 600 ng/mL have been reported in methamphetamine abusers who exhibited violent and irrational behavior. High doses of methamphetamine can also elicit restlessness, confusion, hallucinations, circulatory collapse and convulsions.  
In this case, the level of methamphetamine determined has not been differentiated according to its isomeric forms. Differentiation of the isomers of methamphetamine is available upon request.
12. Morphine - Free (Codeine Metabolite) - Urine:  
Morphine is a DEA Schedule II narcotic analgesic. In analgesic therapy, it is usually encountered as the parent compound; however, it is also commonly found as the metabolite of codeine and heroin. In illicit preparations from which morphine may arise, codeine may be present as a contaminant. A large portion of the morphine is bound to the blood proteins or is conjugated, that which is not bound or conjugated is termed 'free morphine'. Hydromorphone is a reported metabolite of morphine.  
In general, free morphine is the active biologic agent. Morphine has diverse effects that may include analgesia, depression, nausea and respiratory depression. 6-monoacetyl morphine (6-MAM) is the 6-monoacetylated form of morphine, which is pharmacologically active. It is commonly found as the result of heroin use.
13. Norfentanyl (Fentanyl Metabolite) - Hospital Blood:  
Norfentanyl is the primary inactive metabolite of the synthetic narcotic analgesic fentanyl.  
Substance(s) known to interfere with the identity and/or quantity of the reported result: Benzyl Fentanyl

## Sample Comments:

001 Physician/Pathologist Name: Dr. Andrew Baker

Unless alternate arrangements are made by you, the remainder of the submitted specimens will be discarded one (1) year from the date of this report; and generated data will be discarded five (5) years from the date the analyses were performed.

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**Workorder** 20159963  
**Chain** NMSCP59310  
**Patient ID** 2020-3700

Page 6 of 7

## Analysis Summary and Reporting Limits:

Compound	Rpt. Limit	Compound	Rpt. Limit
Isobutyrylfentanyl	0.050 ng/mL	meta-Methylmethoxyacetyl fentanyl	0.050 ng/mL
Methoxyacetyl fentanyl	0.050 ng/mL	ortho-Fluorofentanyl	0.050 ng/mL
THF-F	0.050 ng/mL	para-Fluorobutyrylfentanyl	0.050 ng/mL
U-47700	0.050 ng/mL	para-Fluorofentanyl	0.050 ng/mL
U-49900	0.050 ng/mL	para-Fluorobutyrylfentanyl	0.050 ng/mL
U-51754	0.050 ng/mL	para-Methylmethoxyacetyl fentanyl	0.050 ng/mL
Valeryl Fentanyl	0.050 ng/mL	trans-3-Methylfentanyl	0.050 ng/mL
cis-3-Methylfentanyl	0.050 ng/mL		

Acode 50016U - Postmortem, Urine Screen Add-on (6-MAM Quantification only)

-Analysis by High Performance Liquid Chromatography/ Tandem Mass Spectrometry (LC-MS/MS) for:

Compound	Rpt. Limit	Compound	Rpt. Limit
6-Monoacetylmorphine - Free	5.0 ng/mL	Hydromorphone - Free	5.0 ng/mL
Codeine - Free	25 ng/mL	Morphine - Free	25 ng/mL
Dihydrocodeine / Hydrocodone - Free	25 ng/mL	Oxycodone - Free	25 ng/mL
Hydrocodone - Free	25 ng/mL	Oxymorphone - Free	5.0 ng/mL

Acode 52198B - Cannabinoids Confirmation, Blood - Hospital Blood

-Analysis by High Performance Liquid Chromatography/ Tandem Mass Spectrometry (LC-MS/MS) for:

Compound	Rpt. Limit	Compound	Rpt. Limit
11-Hydroxy Delta-9 THC	1.0 ng/mL	Delta-9 THC	0.50 ng/mL
Delta-9 Carboxy THC	5.0 ng/mL		

Acode 52483B - Amphetamines Confirmation, Blood - Hospital Blood

-Analysis by High Performance Liquid Chromatography/ Tandem Mass Spectrometry (LC-MS/MS) for:

Compound	Rpt. Limit	Compound	Rpt. Limit
Amphetamine	5.0 ng/mL	Methamphetamine	5.0 ng/mL
Ephedrine	5.0 ng/mL	Nonpropionylphenidine	5.0 ng/mL
MDA	5.0 ng/mL	Phentermine	5.0 ng/mL
MDEA	5.0 ng/mL	Phenylpropionylamine	20 ng/mL
MDMA	5.0 ng/mL	Pseudoephedrine	5.0 ng/mL

Acode 52484B - Fentanyl and Acetyl Fentanyl Confirmation, Blood - Hospital Blood

-Analysis by High Performance Liquid Chromatography/ Tandem Mass Spectrometry (LC-MS/MS) for:

Compound	Rpt. Limit	Compound	Rpt. Limit
Acetyl Fentanyl	0.10 ng/mL	Norfenatyl	0.20 ng/mL
Fentanyl	0.10 ng/mL		

Acode 52488B - Designer Opioids Confirmation (2019 Scope), Blood - Hospital Blood

-Analysis by High Performance Liquid Chromatography/ Tandem Mass Spectrometry (LC-MS/MS) for:

Compound	Rpt. Limit	Compound	Rpt. Limit
2-Furanylfentanyl	0.050 ng/mL	Butyrylfentanyl	0.050 ng/mL
4-ANPP	0.10 ng/mL	Carfentanyl	0.050 ng/mL
Acyl Fentanyl	0.050 ng/mL	Cyclopropylfentanyl	0.050 ng/mL

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**Workorder** 20159963  
**Chain** NMSCP59310  
**Patient ID** 2020-3700

Page 7 of 7

## Analysis Summary and Reporting Limits:

Compound	Rpt. Limit	Compound	Rpt. Limit
25C-NBOMe	1.0 ng/mL	Meclizapem	5.0 ng/mL
25I-NBOMe	1.0 ng/mL	Mefenorex	10 ng/mL
25I-NBOMe	1.0 ng/mL	Mefenorexamine	2.0 ng/mL
3-Fluorophenmetrazine	5.0 ng/mL	Methoxphenidine	5.0 ng/mL
3-MeO-PCP	5.0 ng/mL	Methoxypropylfentanyl	0.50 ng/mL
4-ANPP	0.10 ng/mL	Methylone	10 ng/mL
4-MeO-PCP	5.0 ng/mL	Mitraglyne	10 ng/mL
Acetyl Fentanyl	0.50 ng/mL	N-Ethyl-Propylone	10 ng/mL
Acyl Fentanyl	0.10 ng/mL	Penitidine	2.0 ng/mL
BZP	10 ng/mL	Penylone	10 ng/mL
Bromazepam	10 ng/mL	Phenazepam	10 ng/mL
Butylone	10 ng/mL	Pyrazolam	5.0 ng/mL
Butyrylfentanyl	0.10 ng/mL	TFMPP	10 ng/mL
Carfenazone	0.10 ng/mL	THF-F	0.20 ng/mL
Claphedrine	50 ng/mL	U-47700	1.0 ng/mL
Clenazepam	5.0 ng/mL	U-49900	1.0 ng/mL
Cyclopropylfentanyl	0.50 ng/mL	U-51754	1.0 ng/mL
Deslorazepam	5.0 ng/mL	Valeryl Fentanyl	0.50 ng/mL
Desmethoxetazepam	5.0 ng/mL	alpha-PVP	0.50 ng/mL
Dibutylone	10 ng/mL	cis-3-Methylfentanyl	0.10 ng/mL
Diazepam	20 ng/mL	meta-Methylmethoxyacetyl fentanyl	0.50 ng/mL
Ethylone	10 ng/mL	ortho-Fluorofentanyl	0.10 ng/mL
Etolone	10 ng/mL	para-Fluorobutyrylfentanyl	0.10 ng/mL
Flutromazepam	20 ng/mL	para-Fluorofentanyl	0.10 ng/mL
Flutrometazepam	5.0 ng/mL	para-Fluorobutyrylfentanyl	0.10 ng/mL
Isobutyrylfentanyl	0.10 ng/mL	para-Methylmethoxyacetyl fentanyl	0.50 ng/mL
MDVP	10 ng/mL	trans-3-Methylfentanyl	0.10 ng/mL
MPHP	10 ng/mL		

Acode 9096B - Alcohol Screen, Blood (Forensic) - Hospital Blood

-Analysis by Headspace Gas Chromatography (GC) for:

Compound	Rpt. Limit	Compound	Rpt. Limit
Acetone	5.0 ng/mL	Isopropanol	5.0 ng/mL
Ethanol	10 mg/dL	Methanol	5.0 mg/dL

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