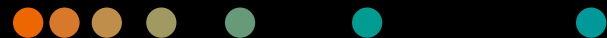


# POC Testing Across the COVID-19 Patient Pathway



# POC Testing Across the COVID-19 Patient Pathway

## Diagnosis



COVID-19 infection?



Molecular  
lab test

## Prognosis



How severe is it?



Immuno/  
chemistry  
lab tests



Hematology  
Hemostasis  
lab tests



Blood  
gas  
tests



CT



X-ray



Ultra-  
sound

## Therapy



How to treat?



Immuno/  
chemistry  
lab tests



Hematology  
Hemostasis  
lab tests



Blood  
gas  
tests



CT



X-ray



Ultra-  
sound

## Follow-up



When recovered?



CT



X-ray



Ultra-  
sound



Immuno/  
chemistry  
Hematology  
lab tests



Molecular  
lab test



Serology  
lab test

# Persons with Chronic Conditions have an Increased Susceptibility to Contracting COVID-19<sup>1,2,3</sup>



## Identification of high risk patients



- Age >55 years
- Any age with severe obesity BMI >40
- Pre-existing pulmonary disease (chronic lung disease or moderate to severe asthma, COPD, lung cancer, pulmonary hypertension, emphysema (smoking, A1AT deficiency))
- Chronic kidney disease
- Diabetes
- History of:
  - hypertension (treated and untreated)
  - cardiovascular disease
  - liver disease
  - transplants or other immunosuppression (ex. cancer treatment)
- All patients with HIV
- Patients with endocrine pathologies
- Use of biologic drugs



Cardiovascular disease



Chronic kidney disease



Heart/liver/kidney transplant



Viral co-infection



Diabetes



Chronic lung disease



Chronic liver disease

Growing statistics point to a strong correlation between people with chronic conditions and their increased susceptibility to COVID-19 along with a higher degree of complications.<sup>1,2,3</sup>

Understanding patient risk and status of chronic conditions during the COVID-19 assessment phase, as well as monitoring function during and after recovery, could be beneficial.

For example, early studies show the importance of increased awareness of kidney impairment for COVID-19 admitted patients.<sup>1</sup>

1. Cheng Y. Kidney disease is associated with in-hospital death of patients with COVID-19. *Kidney International*. 2020.

2. <https://www.cdc.gov/chronicdisease/data/index.htm>; <https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/groups-at-higher-risk.html>

3. Rob Volansky. CDC offers guidance to patients with chronic disease 'living with uncertainty' during COVID-19. April 2020. <https://www.healio.com/news/rheumatology/20200430/cdc-offers-guidance-to-patients-with-chronic-disease-living-with-uncertainty-during-covid19>

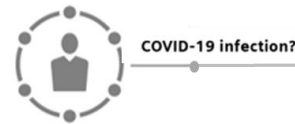
# The Role of POC Testing in the COVID-19 Patient Pathway



Does the patient have diabetes?  
Is the patient's diabetes in control?  
Is the patient at risk of kidney disease?  
Is the patient pregnant?



Diagnosis



## Assessment Stage

People with chronic conditions are more susceptible to COVID-19 along with a higher degree of complications.<sup>4,5</sup>

Would immediate answers to these questions affect COVID-19 patient triage or care?

Siemens Healthineers point of care solutions (on the upcoming slides) can help answer these questions in just minutes.

4. <https://www.cdc.gov/chronicdisease/data/index.htm>; <https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/groups-at-higher-risk.html>

5. Rob Volansky. CDC offers guidance to patients with chronic disease 'living with uncertainty' during COVID-19. April 2020. <https://www.healio.com/news/rheumatology/20200430/cdc-offers-guidance-to-patients-with-chronic-disease-living-with-uncertainty-during-covid19>

# DCA Vantage<sup>®</sup> Analyzer with DCA<sup>®</sup> HbA1c Test



The DCA Vantage<sup>®</sup> Analyzer is a point of care analyzer that offers a CLIA-waived fingerstick test with results in minutes for assessment of blood sugar control over the past three months.

- 1 uL whole blood finger stick
- Results in 6 minutes

# CLINITEK Status<sup>®</sup> Family of Analyzers



Fast, CLIA-waived urine tests for monitoring kidney function, which is affected by COVID-19:

- CLINITEK<sup>®</sup> Microalbumin Reagent Strip for albumin-to-creatinine ratio
- Multistix PRO<sup>®</sup> Reagent Strip for protein-to-creatinine ratio

The analyzer can also provide a quick test to rule out pregnancy with the CLINITEST<sup>®</sup> hCG urine test.

# Prognostic and Therapeutic Stage



epoc® Blood Analysis System



DCA Vantage Analyzer with DCA Microalbumin Creatinine test



RAPIDPoint® 500e Blood Gas System

Some of the major complications<sup>6</sup> of COVID-19 are as follows:

- Early kidney damage,
- Acute kidney injury (AKI)
- Acute respiratory distress (ARDS)
- Sepsis/septic shock

Learn how the following simple, bedside solutions deliver immediate results without the wait.

6. <https://www.webmd.com/lung/coronavirus-complications#1>



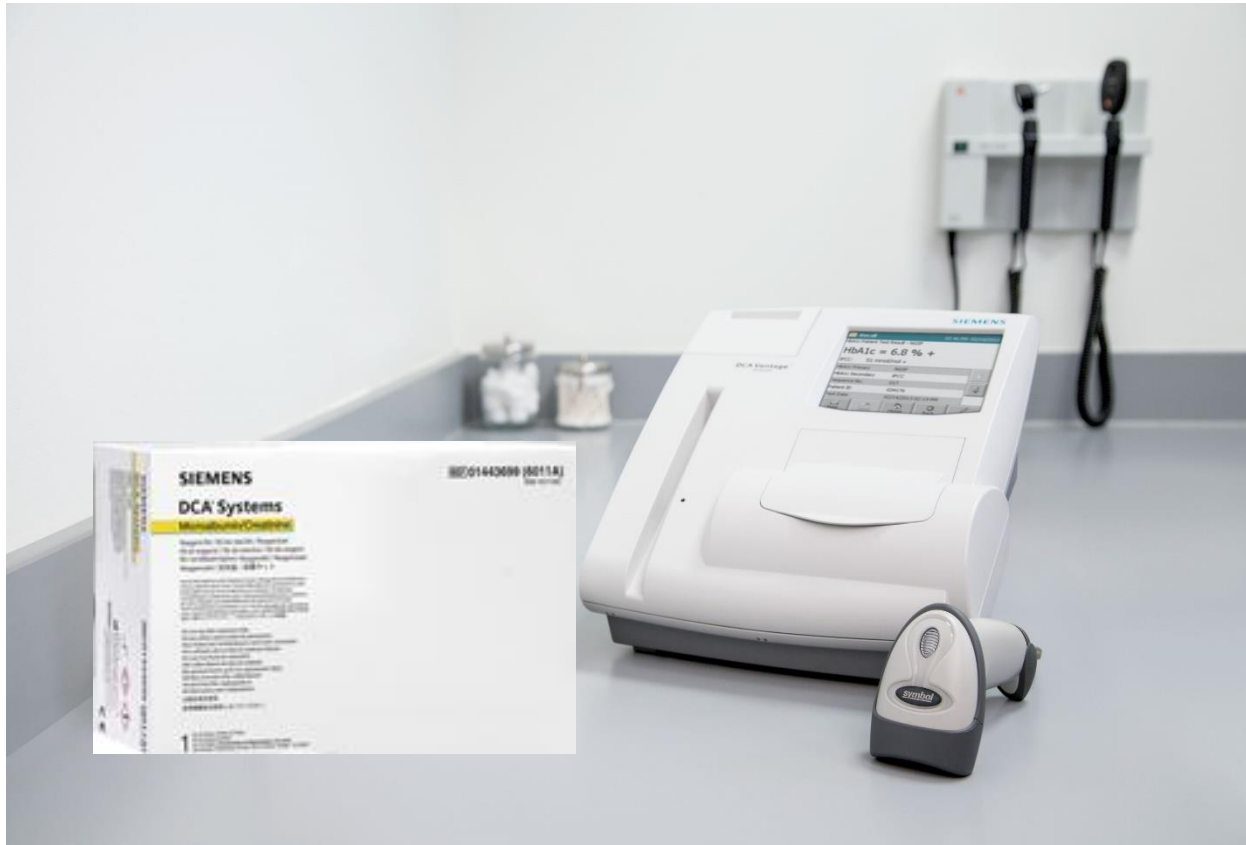


A handheld, wireless analyzer for bedside blood gas and other important markers of sepsis and acute kidney damage.

- Single test card, room temperature storage
- Complete blood gas, basic metabolic panel with hematocrit and lactate
- Results in less than a minute
- 92 µL sample
- Arterial, venous, or capillary whole blood samples
- Barcoded with lot and expiration for error-free test panel recognition
- Simplified quality control and inventory management



# DCA Vantage<sup>®</sup> Analyzer with DCA Microalbumin Creatinine Test



Analyzer provides fully quantitative albumin-to-creatinine ratio (ACR) test. Normalizes urine concentration to more accurately detect traces of albumin in urine, which can indicate potential kidney damage.

- Quantitative microalbumin/creatinine ratio (ACR) test results in minutes.
- Small sample volume—40  $\mu$ L urine.
- Add sample to test cartridge, load, and walk away.
- No sample or reagent preparation required.

# RAPIDPoint® 500e Blood Gas System



A proven end-to-end blood gas solution that reduces the daily burden of device management.

With an improved user experience, the analyzer transforms care delivery, setting an elevated standard in the following areas:

- **Heightened System and Data Security – Minimizing System Vulnerability**
  - Latest IT security defenses
  - WINDOWS 10 operating system with McAfee anti-malware
  - Two-step authentication process and encrypted password requirements
- **Integri-sense™ Technology – Redefining System and Sample Integrity**
- **Simplicity - Allowing More Time for Patients**

# Prognostic and Therapeutic Stage

Major Complications	DCA Vantage Analyzer	epoc Blood Analysis System	RAPIDPoint 500e Blood Gas System
Early kidney damage	ACR	Serum Creatinine	
Acute kidney injury		BUN Serum Creatinine	
Acute Respiratory Distress (ARDS), Acute Respiratory Failure		Arterial blood gases: <ul style="list-style-type: none"> <li>• pH (acidity and alkalinity)</li> <li>• Oxygen levels (pO2)</li> <li>• Carbon dioxide levels (pCO2)</li> <li>• Aid in ventilator setting changes</li> </ul>	ARDS - Arterial blood gases: <ul style="list-style-type: none"> <li>- Ph</li> <li>- Oxygen levels (pO2)</li> <li>- Carbon dioxide levels (pCO2)</li> <li>- Aid in ventilator setting changes</li> </ul>
Sepsis/Septic Shock		Lactate	Lactate

Early studies indicate that coronaviruses (SARS, MERS, CoV-2) replicate in kidney tissues, causing damage and triggering renal failure.<sup>7,8,9,10</sup>

7. Diao B, et al. Human kidney is a target for novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection. Available from: <https://doi.org/10.1101/2020.03.04.20031120>

8. Pacciarini F, et al. Persistent replication of severe acute respiratory syndrome coronavirus in human tubular kidney cells selects for adaptive mutations in the membrane protein. *J Virol.* 2008 Jun;82(11):5137-44.

9. Eckerle I, et al. In-vitro renal epithelial cell infection reveals a viral kidney tropism as a potential mechanism for acute renal failure during Middle East respiratory syndrome (MERS) coronavirus infection. *Virology Journal.* 2013;10:359.

10. Wu VC, et al. and The SARS Research Group of the National Taiwan University College of Medicine and National Taiwan University Hospital. Acute renal failure in SARS patients: more than rhabdomyolysis. *Nephrol Dial Transplant.* 2004; 19:3180-2.

# Acute Kidney Injury Statistics in patients with COVID-19<sup>11</sup>

9%

developed  
acute kidney  
injury (AKI)

34%

developed  
albuminuria  
on the first day  
of admission

63%

developed  
proteinuria  
during their stay  
in the hospital



- Urinalysis is the most important noninvasive test in the initial workup of acute kidney injury.
- Findings of urinalysis guide the differential diagnosis and direct further workup.<sup>12</sup>

11. The novel coronavirus 2019 epidemic and kidneys. *Kidney International*. 2020. Available from: <https://doi.org/10.1016/j.kint.2020.03.001>

12. Rahman M, Shad F, Smith M. Acute kidney injury: a guide to diagnosis and management. *Am Fam Physician*. 2012;86(7):631-9.

# Delivering POC Solutions That Matter

**Thank You  
for Your Enthusiasm!**

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**Siemens Healthineers**

40 Liberty Boulevard

Malvern, PA 19355

[siemens-healthineers.com/en-us](https://www.siemens-healthineers.com/en-us)