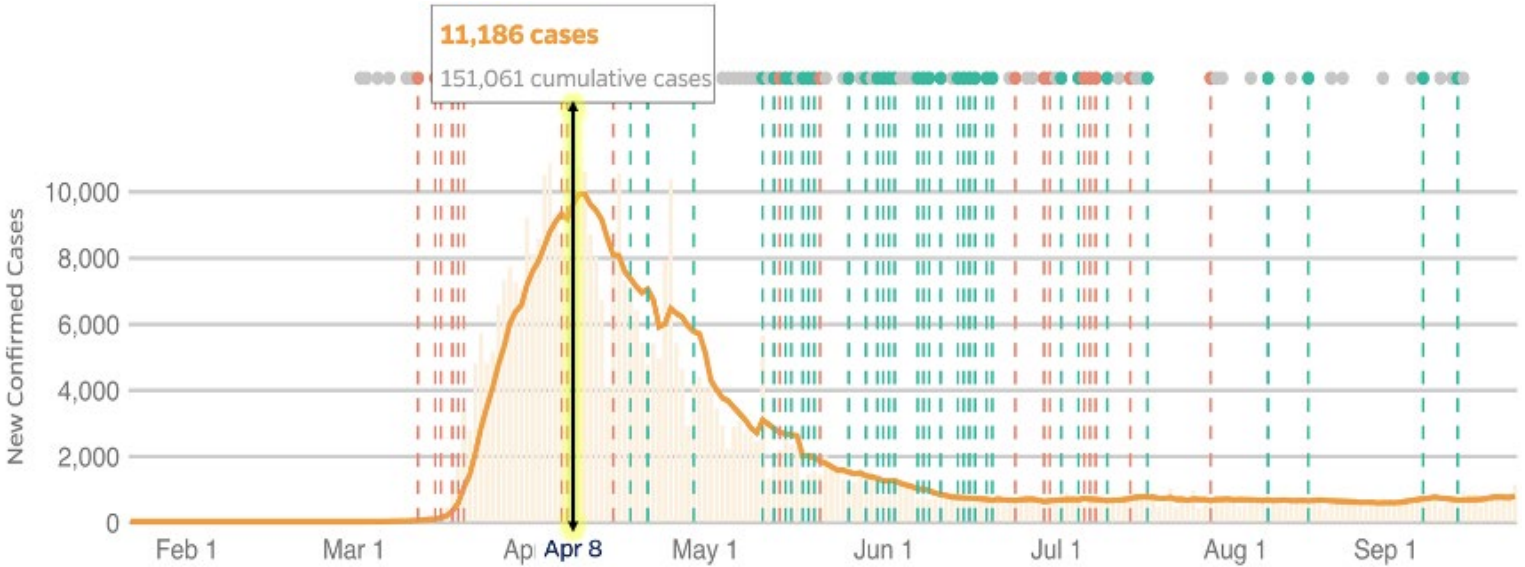
Acute Peritoneal Dialysis in a Time of Crisis

Maryanne Sourial, DO
Assistant Professor of Medicine
Department of Medicine / Division of Nephrology

Montefiore

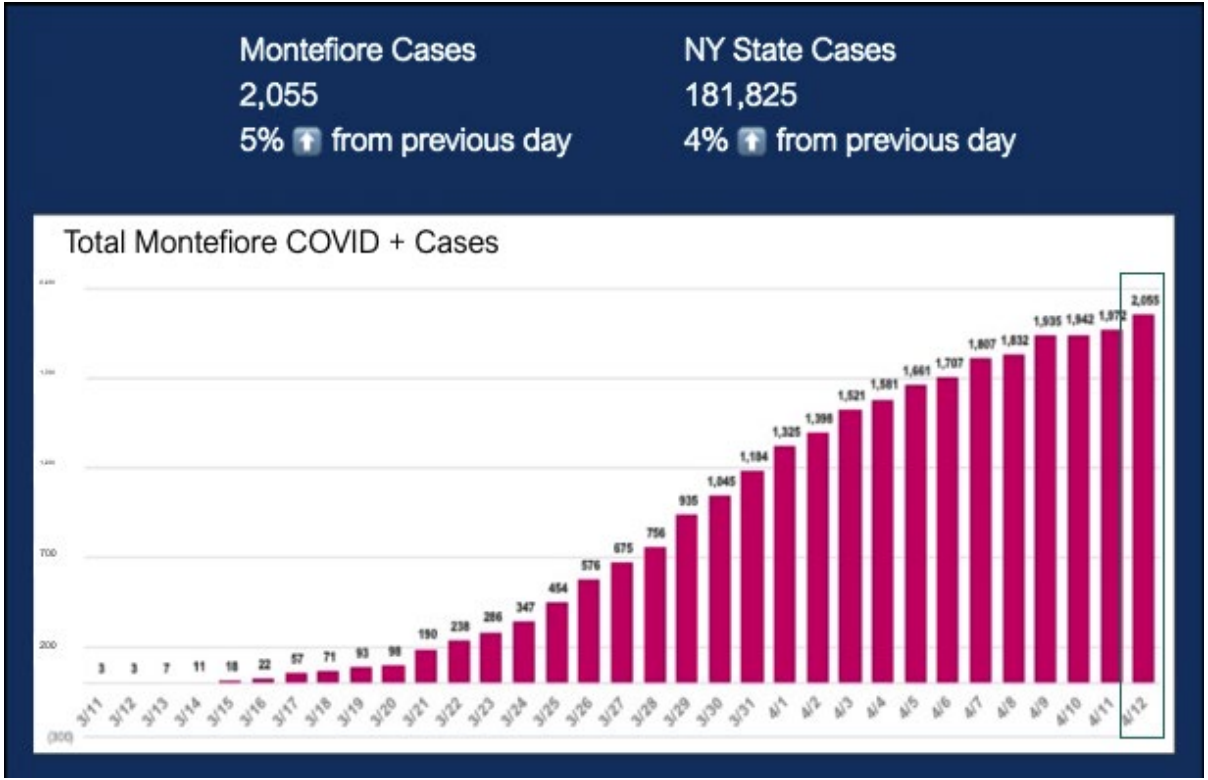
New cases peaked at ~11,000 on April 8th in New York State



New confirmed cases of COVID-19 started March 3rd and peaked on April 8th, with 11,186 new cases reported that day

John Hopkins Coronavirus Resource Center: COVID-19 United States cases by county, 2020. Available at: https://coronavirus.jhu.edu/us-map. Accessed 9/20/20

Daily COVID Census at Montefiore: Peaked at 2055 on April 12, 2020



RRT Resource Shortages Realized

POLITICO

CORONAVIRUS

U.S. races to stock up on dialysis supplies as kidney failure ravages virus patients

Approximately 20 percent of coronavirus patients in intensive care around the city need the kidney treatment, often for weeks.

The New York Times

An Overlooked, Possibly Fatal Coronavirus Crisis: A Dire Need for Kidney Dialysis

Ventilators aren't the only machines in intensive care units that are in short supply. Doctors have been confronting an unexpected rise in patients with failing kidneys.

By Reed Abelson, Sheri Fink, Nicholas Kulish and Katie Thomas

Published April 18, 2020 Updated April 20, 2020

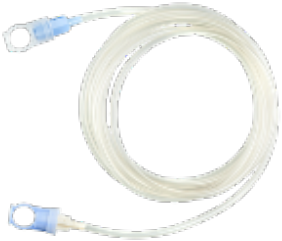
Perspective

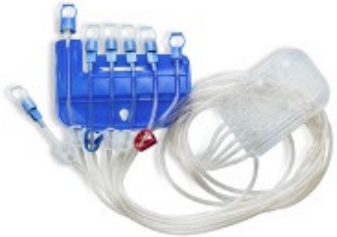
Impending Shortages of Kidney Replacement Therapy for COVID-19 Patients

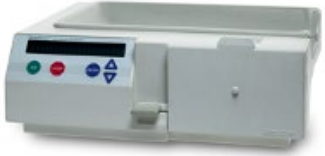
David S. Goldfarb,[1,2] Judith A. Benavic,[2] Olga Zhdanova,[2,3] Elizabeth Hammer,[2] Clay A. Block,[4] Nina J. Caplin,[2,5] Nathan Thompson,[2,5] and David M. Charytan[6]

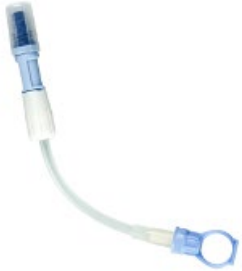
CJASN 15: 880–882, 2020. doi: https://doi.org/10.2215/CJN.05180420

Supplies





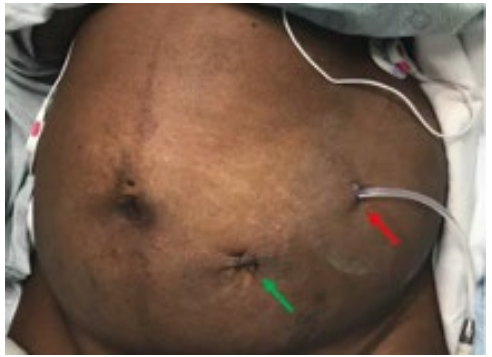


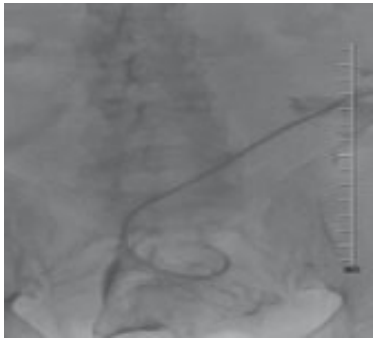


- Limited to no OR time = difficulty placing PD catheters

Access Needed to Start PD

- Transplant surgeons performed bedside laparoscopically-assisted flexible PD catheter placement for intubated and ICU patients
- Interventional radiologists placed fluoroscopically-guided flexible PD catheter placement for non-intubated non-ICU patients





Limited Staff

- Due to illness and higher patient to RN ratio than usual, less RNs available for iHD and CRRT

- Started PD training
- Started “Urgent PD Service”
  - Patient rounds
  - Perform manual exchanges
  - Provide training to RNs and house staff residents
  - Set up cycler PD once available

Increased Demand for PD

- As more patients were started on PD, the demand for more trained providers increased

- Additional time for training (both RNs and MDs)
- Increased staffing of Urgent PD Service
- Addition of Cycler-assisted PD

Prone Positioning

- Increased leaks despite low volume PD
- Increased intra-abdominal pressure associated with vent dyssynchrony

- PD performed in supine position
- Supplemental iHD or CRRT, if needed

Patient Characteristics:

Lots of ventilated, pronated patients

Characteristic	Value
No. patients started on PD (April 1-22)	30
Patient location at time of PD initiation	
Ward	12/30 (40%)
ICU	18/30 (60%)
Mechanical Ventilation Status	
Intubated	22/30 (73%)
Placed in prone position	*16/22 (73%)*
Never placed in prone position	*6/22 (27%)*
Non-intubated	8/30 (27%)
Placed in prone position	*1/8 (13%)*
Never placed in prone position	*7/8 (88%)*

Patient Characteristics (continued):

PD often supplemented or switched to other modalities

Characteristic	Value
Supplemental RRT	
CRRT	5/30 (17%)
iHD	6/30 (20%)
Modality Switch	
To CRRT	2/30 (7%)
To iHD	7/30 (23%)

Patient Outcomes:

High mortality rate in patients with COVID and AKI on RRT

Characteristic	Value
Still hospitalized	8/30 (27%)
Still on PD	0/8
Still on iHD/CRRT (no longer on PD)	4/8 (50%)
With renal recovery (no longer on RRT)	4/8 (50%)
Died during hospitalization	14/30 (47%)
With AKI on RRT	13/14 (93%)
With renal recovery at time of death	1/14 (7%)
Discharged home	8/30 (27%)
Still on PD	3/8 (38%)
With renal recovery	5/8 (63%)

Patient Outcomes (continued):

Outcome	Number of patients
Alive, no longer on RRT	9/30 (30%)
Alive, still on PD	1/30 (3.3%)
Alive, on HD	2/30 (6.7%)
Died	18/30 (60%)

Limitations

- Rapid deployment meant troubleshooting as the program expanded
- Variability in PD Rx initially
- Selection for PD was not based on typical “criteria” for patient selection
- Lack of structured supply delivery due to new ICU locations

Goals

- Develop a streamlined program for initiation of peritoneal dialysis in the hospital for patients with AKI requiring dialysis
  - RN training for cycler-assisted/automated PD
    - Additional RN training for manual PD
  - Initial PD prescription protocol
  - Structured supply delivery
  - Outpatient dialysis unit follow up (if RRT still needed) vs. outpatient clinic follow up

Montefiore

Thank you!