Claims

1. A system for controlling tidal peritoneal dialysis for a patient, the system comprising:

a device communicative with an apparatus for performing the tidal peritoneal dialysis, the device configured for:

measuring solute levels in a set of samples of tidal dialysate discharged from the patient while the patient is undergoing the tidal peritoneal dialysis;

determining a current solute clearance from the tidal peritoneal dialysis based on:

(i) the measured solute levels in the samples of tidal dialysate;

(ii) tidal volumes of the samples of tidal dialysate; and

(iii) a device efficiency factor that accounts for dead volumes associated with the tidal peritoneal dialysis;

comparing the current solute clearance with a target solute clearance for the patient;

generating, based on the comparison, control instructions for a set of parameters of the tidal peritoneal dialysis; and

controlling the parameters based on the control instructions while the patient is undergoing the tidal peritoneal dialysis to thereby adjust the current solute clearance towards the target solute clearance.

2. The system according to claim 1, the device further configured for:

extracting the samples of tidal dialysate as a set of sacrificial samples; and

measuring the solute levels in the sacrificial samples.

3. The system according to claim 1 or 2, wherein the device is configured for measuring the solute levels in the samples of tidal dialysate after a predefined duration after the tidal dialysate begins discharging from the patient.

4. The system according to any one of claims 1 to 3, the device further configured for measuring solute levels in a set of samples of drained dialysate that is drained from the patient after the tidal peritoneal dialysis has ended.

5. The system according to claim 4, the device further configured for determining a total solute clearance from the tidal peritoneal dialysis based on the measured solute levels in the samples of tidal dialysate, the tidal volumes of the samples of tidal dialysate, and the measured solute levels in the samples of drained dialysate.

6. The system according to claim 5, the device further configured for:

comparing the total solute clearance with the target solute clearance;

generating, based on the comparison, control instructions for the parameters of a subsequent tidal peritoneal dialysis for the patient; and

controlling the parameters based on the control instructions for the subsequent tidal peritoneal dialysis.

7. A system for controlling tidal peritoneal dialysis for a patient, the system comprising:

a local device communicative with an apparatus for performing the tidal peritoneal dialysis,

a remote server communicative with the local device, the remote server configured for:

receiving, from the local device, tidal measurement data comprising solute levels measured in a set of samples of tidal dialysate discharged from the patient while the patient is undergoing the tidal peritoneal dialysis;

determining a current solute clearance from the tidal peritoneal dialysis based on:

(i) the measured solute levels in the samples of tidal dialysate;

(ii) tidal volumes of the samples of tidal dialysate; and

(iii) a device efficiency factor that accounts for dead volumes associated with the tidal peritoneal dialysis;

comparing the current solute clearance with a target solute clearance for the patient;

generating, based on the comparison, control instructions for a set of parameters of the tidal peritoneal dialysis; and

sending, to the local device, the control instructions for controlling the parameters while the patient is undergoing the tidal peritoneal dialysis to thereby adjust the current solute clearance towards the target solute clearance.

8. The system according to claim 7, the remote server further configured for:

receiving, from the local device, drained measurement data comprising solute levels measured in a set of samples of drained dialysate that is drained from the patient after the tidal peritoneal dialysis has ended; and

determining a total solute clearance from the tidal peritoneal dialysis based on the measured solute levels in the samples of tidal dialysate, the tidal volumes of the samples of tidal dialysate, and the measured solute levels in the samples of drained dialysate.

9. The system according to claim 8, the remote server further configured for:

comparing the total solute clearance with the target solute clearance;

generating, based on the comparison, control instructions for the parameters of a subsequent tidal peritoneal dialysis for the patient; and

sending, to the local device, the control instructions for controlling the parameters of the subsequent tidal peritoneal dialysis.

10. A system for controlling tidal peritoneal dialysis for a patient, the system comprising:

a local device communicative with an apparatus for performing the tidal peritoneal dialysis,

a remote computer communicative with the local device, the remote computer configured for:

measuring solute levels in a set of pre-obtained samples of tidal dialysate discharged from the patient while the patient is undergoing the tidal peritoneal dialysis;

measuring solute levels in a set of pre-obtained samples of drained dialysate that is drained from the patient after the tidal peritoneal dialysis has ended;

determining a total solute clearance from the tidal peritoneal dialysis based on:

(i) measured solute levels in the samples of tidal dialysate,

(ii) tidal volumes of the samples of tidal dialysate;

(iii) the measured solute levels in the samples of drained dialysate; and

(iv) a device efficiency factor that accounts for dead volumes associated with the tidal peritoneal dialysis;

comparing the total solute clearance with a target solute clearance for the patient;

generating, based on the comparison, control instructions for a set of parameters of a subsequent tidal peritoneal dialysis for the patient; and

sending, to the local device, the control instructions for controlling the parameters for the subsequent tidal peritoneal dialysis to thereby adjust the total solute clearance from the subsequent tidal peritoneal dialysis towards the target solute clearance.