A Standardized Algorithm for Peritonitis Surveillance

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- **All authors were employed at DaVita HealthCare Partners, Inc, Denver, CO, USA at the time of the study**
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Background

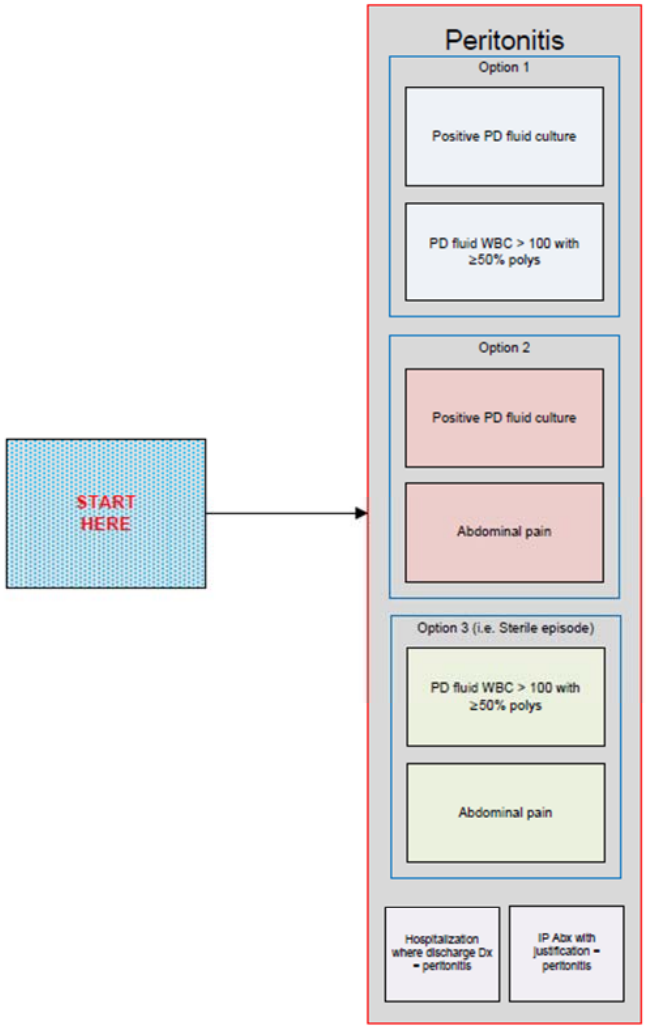
- **Peritonitis is an important clinical outcome in the peritoneal dialysis modality**
- **A standardized process used with large data and analytics can be a useful tool in peritonitis surveillance**
  - **Standardization in the application of case definitions and business rules is fundamental to epidemiology and infection surveillance**
- **Inter- and intra-facility quality evaluations cannot be performed without standardization**

Methods

- Review of the literature
- Convocation of internal subject matter experts
- Imputation of logic where no guidance was available
- 5-step algorithm developed
- Algorithm evaluated by experienced peritoneal dialysis nurses

Step 1: Define an Event of Peritonitis

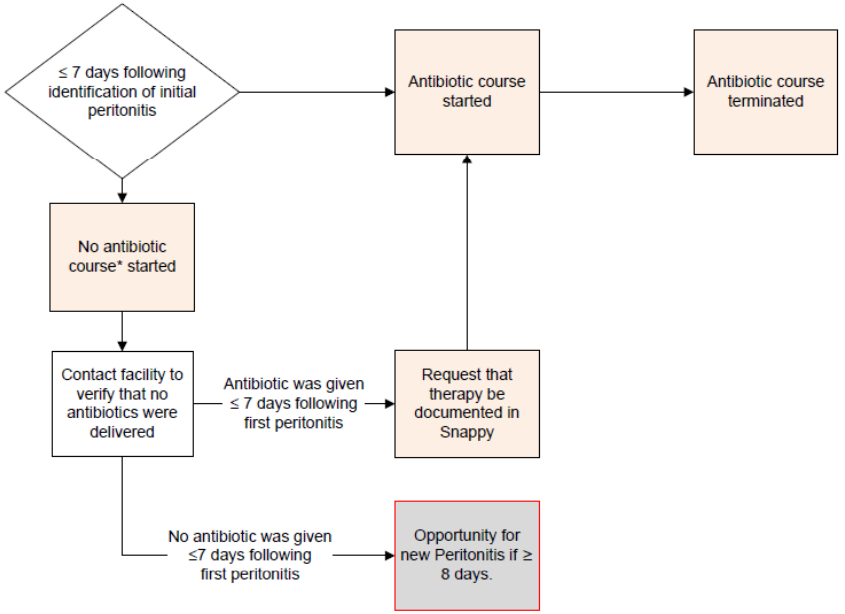
- **Minimal necessary criteria***
- **2 of these 3:**
  - **Positive peritoneal dialysis fluid culture**
  - **Peritoneal dialysis fluid WBC > 100 with ≥ 50% polys**
  - **Abdominal pain**
- **1 of the following conditions:**
  - **Hospitalization with discharge diagnosis of peritonitis**
  - **Intraperitoneal antibiotics with justification of peritonitis**



* Vas SI. Microbiologic aspects of chronic ambulatory peritoneal dialysis. Kidney Int. 1983 Jan;23(1):83–92.

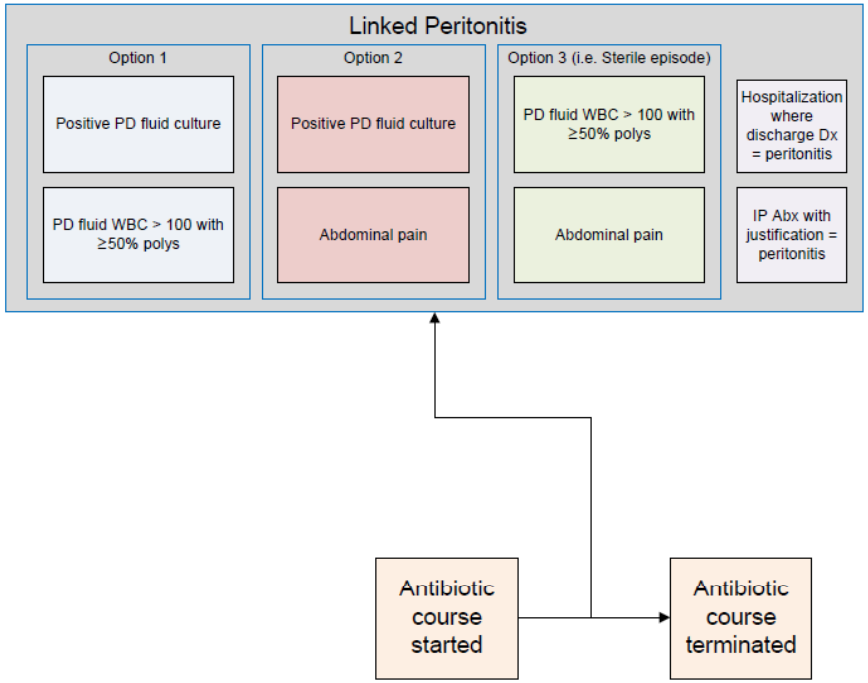
Step 2: Identify Antimicrobial Therapy

- 7- day window to begin therapy
- If no therapy is delivered, opportunity for new event begins
- Courses of therapy are defined by an 8-day inclusive washout period



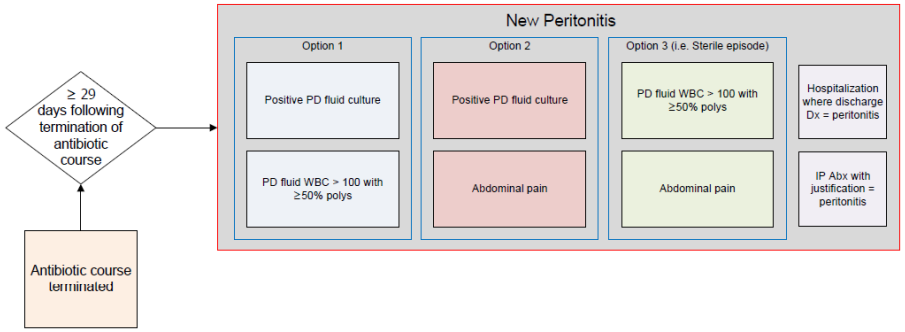
Step 3: Events During Antimicrobial Therapy

- **Identified events of peritonitis that occur during the course of therapy are considered "linked" to the first case and not included in peritonitis rates**



Step 4: Events ≥ 29 Days Following Therapy

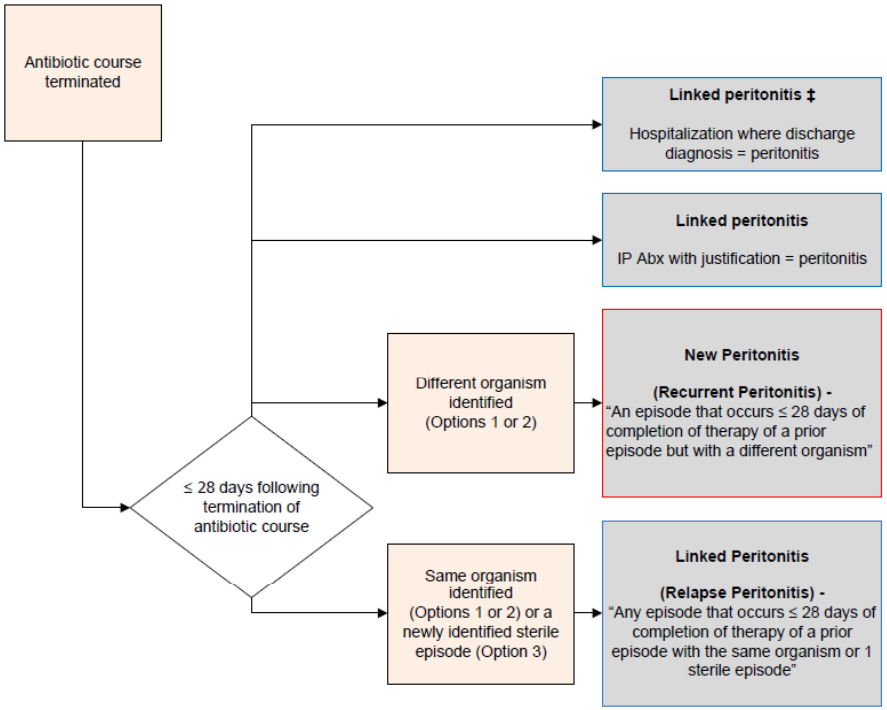
- **29 days following the termination of therapy, any event of peritonitis identified is included in the peritonitis rate, and algorithm starts again**



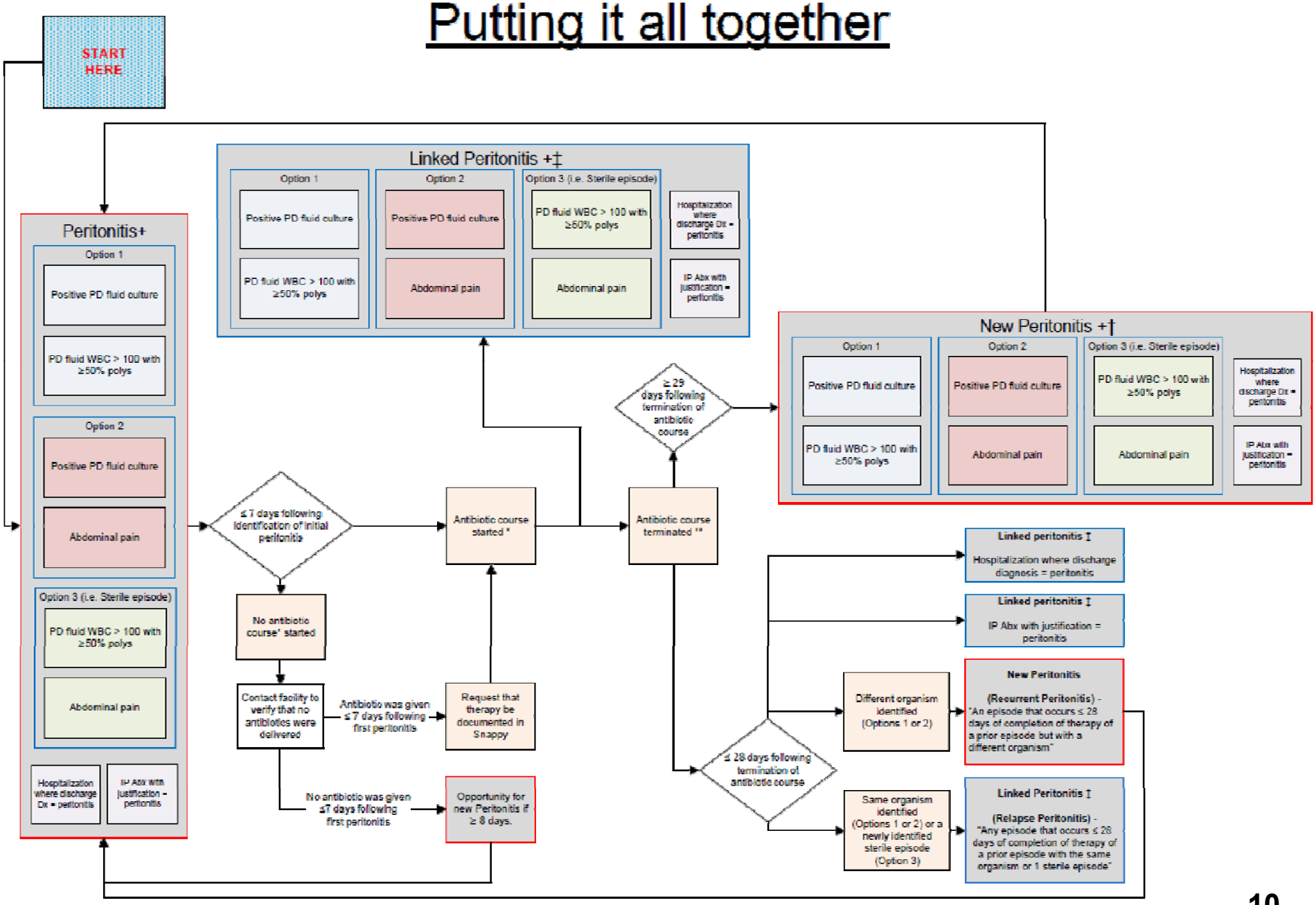
Step 5: Events ≤ 28 Days Following Therapy

If events are identified within 28 days following the termination of therapy, then:

- **Not included in rate**
  - **Events identified through hospitalization alone**
  - **Events identified through intraperitoneal therapy alone**
  - **Relapsing events (same organism or sterile episode)**
- **Included in rate**
  - **Recurrent event (different organism)**

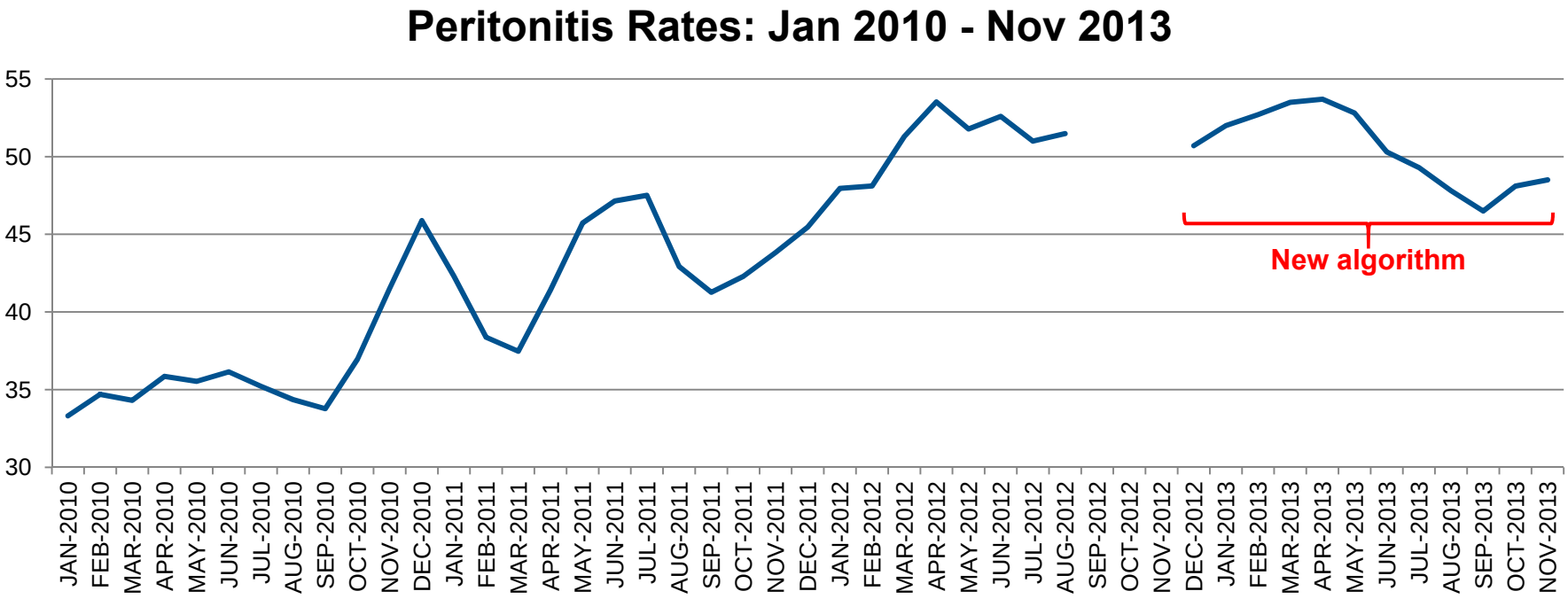


Putting it all together



Algorithm Performance

- **Algorithm-generated reporting made available to 945 dialysis facilities in August 2013**
  - **Executed on Python and SAS® platforms**
- **Code output and data flows routinely monitored**



Results

- **Peritonitis rates and patient observations were validated by peritoneal dialysis nurses and found to be accurate and reliable**
  - **Individual cases validated at facility level**
- **Algorithm application reduced clinician time needed for reporting, exposed data entry errors correctable in the electronic medical record, and permitted standardized surveillance of peritonitis in dialysis facilities**

Next Steps

- Continue to monitor the performance of our algorithm
- Publish our experience in the peer-reviewed literature
- Promote discussion on the value of a standardized approach to peritonitis surveillance
- Promote discussion to improve peritonitis surveillance approaches and definitions

Questions and Answers