Ventriculitis Definition

This is an algorithm designed to **retrospectively** determine patients with ventriculitis. Currently, the algorithm is designed and evaluated using CUIMC data from 2006 to 2024. Therefore, due to data availability, practice variability over hospitals and time, minor tweaks within the algorithm may need to be applied prior to usage.

We created 4 different case scenarios, which we will refer to as cases for short, to capture patients with ventriculitis. Patients are considered to be within the ventriculitis cohort, if they are found to reside within **any** of the 4 cases.

- **Case 1.1:** Patients who were prescribed antibiotics explicitly for the purpose of treating central nervous system (CNS) infection for more than 2 consecutive days. (Somewhat CUIMC specific)
- **Case 1.2:** Patients who were given ceftriaxone 2g q12h for more than 2 consecutive days. (CUIMC specific)
- **Case 2:** Patients who were found with a positive CSF culture.
- **Case 3:** Patients with vancomycin dosage era of more than 5 days, while another ventriculitis specific medication was given, and indication of ventriculitis were seen from lab results.
- **Case 4:** Patients without antibiotics information but with strong lab indication for ventriculitis.

Required data: Labs (high importance), antibiotic order information (high importance), CSF culture (important), trough level information (optional), MRSA swab result (optional).

Case 1.1: Patients who were prescribed antibiotics **explicitly for the purpose of treating central nervous system (CNS) infection** for **more than 2** consecutive days.

- For more than 2 days, we mean > 2 days, rather than >= 2 days.

Case 1.2: Patients who were given ceftriaxone 2g q12h for more than 2 consecutive days.

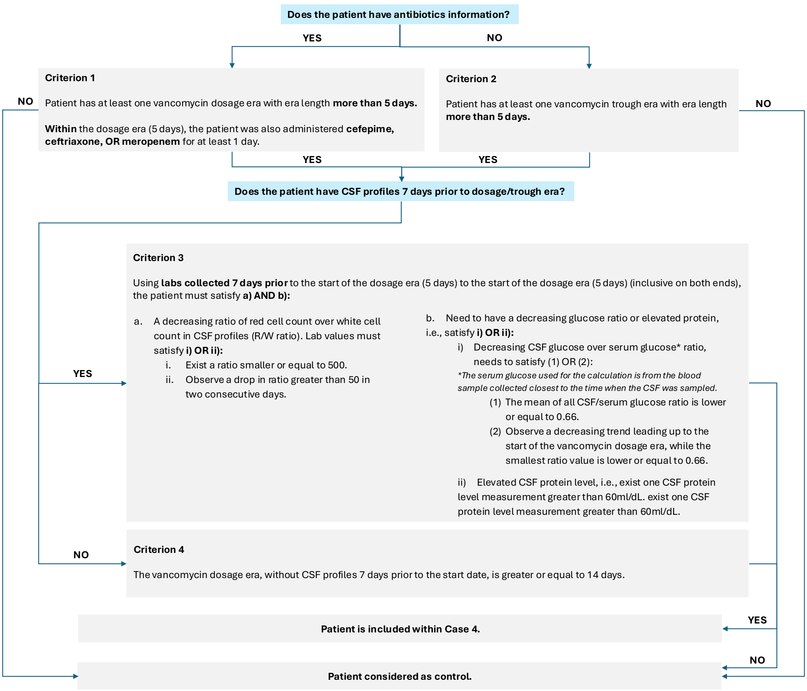
- This dosage of ceftriaxone is only given for ventriculitis treatment at CUIMC.

Case 2: Patients who were found with a positive CSF culture.

This includes all patients who received a CSF culture result of either **1), 2), OR 3):**

1) At least moderate growth seen.
2) Explicit mention of the positive bacteria or organism.
3) Result from susceptibility testing.

Case 3: Patients with vancomycin dosage era of more than 5 days, while another ventriculitis specific medication was given, and indication of ventriculitis were seen from lab results.



Case 4: Patients without antibiotics information but with strong lab indication for ventriculitis.

- Case 4 is designed for patients who **only have lab information**.

1) Using **all lab values**, mark **all** occurrences of when the patient satisfies the decreased R/W ratio criterion. Patient must have at least one occurrence that satisfy the R/W ratio criterion.

   Definition for decreased R/W ratio is the same as Case 3, Criterion 3, sub-criterion a.

2) Combine occurrences found in step 1) into events. Patients must have at least one event with event length **more than 3 days.**
3) Per event with length more than 3 days, we will use labs collected between:
   a. Event start time to 7 days past event start time (inclusive on both ends), *if event length is less than 7 days*.
   b. Event start time to event end time (inclusive on both ends), *if event length is greater or equal to 7 days*.

   Using lab values within appropriate time frame (either a or b), we will look for CSF/serum glucose and CSF protein. Only when the patient has **both decreasing CSF/serum glucose AND elevated CSF protein** will they be added to case 4.

   Definition for decreasing CSF/serum glucose is the same as Case 3, Criterion 3, sub-criterion b, condition i).

   Definition for elevated CSF protein is the same as Case 3, Criterion 3, sub-criterion b, condition ii).

Remark

We also considered differentiating pneumonia patients using the timing of vancomycin dosage era end dates and MRSA swab result times. We hypothesized that if the patient's vancomycin dosage was paused after their MRSA swab came back negative, the patient may have been treated for pneumonia rather than ventriculitis.

Remark 2

This algorithm is designed to have high sensitivity, meaning it will capture most patients with ventriculitis. As a result, it will return us with more false positives than desired.