Does This Adult Patient Have Acute Meningitis?

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Context Early clinical recognition of meningitis is imperative to allow clinicians to efficiently complete further tests and initiate appropriate therapy.

Objective To review the accuracy and precision of the clinical examination in the diagnosis of adult meningitis.

Data Sources A comprehensive review of English- and French-language literature was conducted by searching MEDLINE for 1966 to July 1997, using a structured search strategy. Additional references were identified by reviewing reference lists of pertinent articles.

Study Selection The search yielded 139 potentially relevant studies, which were reviewed by the first author. Studies were included if they described the clinical examination in the diagnosis of objectively confirmed bacterial or viral meningitis. Studies were excluded if they enrolled predominantly children or immunocompromised adults or focused only on metastatic meningitis or meningitis of a single microbial origin. A total of 10 studies met the criteria and were included in the analysis.

Data Extraction Validity of the studies was assessed by a critical appraisal of several components of the study design. These components included an assessment of the reference standard used to diagnose meningitis (lumbar puncture or autopsy), the completeness of patient ascertainment, and whether the clinical examination was described in sufficient detail to be reproducible.

Data Synthesis Individual items of the clinical history have low accuracy for the diagnosis of meningitis in adults (pooled sensitivity for headache, 50% [95% confidence interval CI], 32%-68%); for nausea/vomiting, 30% [95% CI, 22%-38%]). On physical examination, the absence of fever, neck stiffness, and altered mental status effectively eliminates meningitis (sensitivity, 99%-100% for the presence of 1 of these findings). Of the classic signs of meningeal irritation, only 1 study has assessed Kernig sign; no studies subsequent to the original report have evaluated Brudzinski sign. Among patients with fever and headache, jolt accentuation of headache is a useful adjunctive maneuver, with a sensitivity of 100%, specificity of 54%, positive likelihood ratio of 2.2, and negative likelihood ratio of 0 for the diagnosis of meningitis.

Conclusions Among adults with a clinical presentation that is low risk for meningitis, the clinical examination aids in excluding the diagnosis. However, given the seriousness of this infection, clinicians frequently need to proceed directly to lumbar puncture in high-risk patients. Many of the signs and symptoms of meningitis have been inadequately studied, and further prospective research is needed.

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sensitivity will aid clinicians in deciding against invasive investigation, particularly for those patients for whom the clinical suspicion of meningitis is relatively low.

This systematic review will focus on the features of history taking and physical examination that clinicians use to identify adult, immunocompetent patients at risk for acute meningitis for whom further diagnostic testing is indicated. We use the term meningitis to refer to acute infections of the meninges of either bacterial or viral origin.

**Pathophysiology of Meningitis**

The brain is protected from infection by the skull; the pia, arachnoid, and dural meninges covering its surface; and the blood-brain barrier. Once the blood-brain barrier is breached, the clinical features of meningitis are a reflection of the underlying pathophysiologic processes (TABLE 1). Systemic infection generates nonspecific findings such as fever, myalgia, and rash. Once the blood-brain barrier is breached, an inflammatory response within the cerebrospinal fluid occurs. The resultant meningeal inflammation and irritation elicit a protective reflex to prevent stretching of the inflamed and hypersensitive nerve roots, which is detectable clinically as neck stiffness or Kernig or Brudzinski signs.11,12 The meningeal inflammation may also cause headache and cranial nerve palsies.13 If the inflammatory process progresses to cerebral vasculitis or causes cerebral edema and elevated intracranial pressure, then alterations in mental status, headache, vomiting, seizures, and cranial nerve palsies may ensue.10

**Examination for the Signs and Symptoms of Meningitis**

The classic clinical presentation of acute meningitis is the triad of fever, neck stiffness, and an altered mental state. However, less than two thirds of patients present with all 3 clinical findings.6 While taking the patient’s history, clinicians suspecting meningitis will examine for general symptoms of infection (such as fever, chills, and myalgias), as well as symptoms suggesting central nervous system infection (photophobia, headache, nausea and vomiting, focal neurologic symptoms, or changes in mental status).

The physical examination must include checking the vital signs and a brief mental status examination. General inspection may reveal a rash. In patients with severe meningeal irritation, the patient may spontaneously assume the tripod position (also called Amoss sign or Hoyne sign) with the knees and hips flexed, the back arched lordotically, the neck extended, and the arms brought back to support the thorax.14

Physical examination specifically for meningitis includes assessing neck stiffness, testing for Kernig and Brudzinski signs, and assessing jolt accentuation of headache. Neck stiffness is assessed by examining the neck for rigidity by gentle forward flexion with the patient in the supine position.

Like neck stiffness, Kernig and Brudzinski signs also indicate meningeal irritation. Vladimir Kernig, a Russian physician, first published the description of the sign that bears his name in 1884.11,15 Although the sign had been previously described by Lazarevic in 1880 and by Forst in 1881.14 In Kernig’s original description, when patients sat on the edge of a bed with their legs dangling, an attempt to extend the knee joint more than 135°, or in severe cases more than 90°, elicited spasm of the extremity that disappeared when the patient lay supine or stood up. Today, the maneuver is most commonly performed with the patient lying supine and the hip flexed at 90°. A positive sign is present when extension of the knee from this position elicits resistance or pain in the lower back or posterior thigh.

In 1909, Josef Brudzinski, a Polish physician, described many meningeal signs in children.11,16 His best known
“nape of the neck” sign (Brudzinski sign) is present when passive neck flexion in a supine patient results in flexion of the knees and hips. A separate sign, the contralateral reflex, is present if passive flexion of one hip and knee causes flexion of the contralateral leg.

An additional maneuver in assessing for meningitis is to elicit jolt accentuation of the patient’s headache by asking the patient to turn his or her head horizontally at a frequency of 2 to 3 rotations per second. Worsening of a baseline headache represents a positive sign.17

A complete neurologic examination follows these more specific tests for meningitis, including examination of the cranial nerves, the motor and sensory systems, reflexes, and testing for Babinski reflex. A general examination follows, with an emphasis on the ears, sinuses, and respiratory system.

METHODS

Literature Search and Selection

We searched MEDLINE for articles from 1966 to July 1997 using a structured search strategy (available from the authors on request) to retrieve English- and French-language articles describing the precision and accuracy of the clinical examination in the diagnosis of meningitis. This search strategy yielded 139 abstracts, which were reviewed by one of us (J.A.) for relevance. Full-text articles were retrieved for abstracts that potentially met the inclusion criteria. Additional references were identified by searching the reference lists of pertinent articles.

Explicit inclusion and exclusion criteria were applied to the retrieved articles. We included articles that were original studies describing the accuracy or precision of the clinical examination in the diagnosis of meningitis in which the majority of patients had objectively confirmed bacterial or viral meningitis. We excluded studies that enrolled only children or immunocompromised adults; described mixed patient populations from which adult data could not be extracted; or focused only on metastatic meningitis, or meningitis of a single specific microbial origin (ie, Listeria meningitidis or Mycobacterium tuberculosis). Tuberculous meningitis was also excluded on the grounds that this infection is more prevalent in patients with human immunodeficiency virus infection18 and children, neither of which represent our target population. However, in 2 studies in which there were insufficient data to separate the patients with tuberculous meningitis, we have retained them in our analyses17,19 (TABLE 2).

Study Characteristics

This systematic review differs from previous Rational Clinical Examination articles in that all but 117 of the 10619-26 articles that met our inclusion criteria were retrospective chart reviews. These studies assessed the clinical presentation of a total of 845 patient-episodes (824 patients), in patients aged 16 to 95 years, with meningitis confirmed by lumbar puncture or autopsy (Table 2).

Because no quality grading system for chart reviews has been widely established, we assessed the validity of these studies by critically appraising several components of the study design (Table 2). These components included an assessment of the reference standard used to diagnose meningitis (lumbar puncture or autopsy), the completeness of patient ascertainment, and whether the clinical examination was described in sufficient detail to be reproducible. The major limitation common to all these studies was the lack of a control population, which means that only sensitivities were available for most of the clinical findings. In addition, the reported sensitivities may overestimate the true sensitivities (as could be established in a prospective study) because the clinical examinations recorded in the charts could have been performed with knowledge of the lumbar puncture results.

The single prospective study included 54 inpatients and outpatients presenting with fever and headache to a Japanese center (Table 2).17 A standardized clinical examination was performed by an examiner before lumbar puncture was undertaken and clinical findings were compared with those of cerebrospinal fluid pleocytosis.

Data Analysis

Clinical examination findings that differ between viral and bacterial causes are explicitly indicated. Sensitivities for the various signs and symptoms of meningitis were calculated from the data in each study. Pooled sensitivities were calculated for each feature of the clinical examination, using a random effects model.27 Clinical features are included in the tables and text of the “Results” section.

Because control groups of patients without meningitis were not included in the 9 retrospective studies, specificities for many features of the clinical examination were unavailable. For the findings assessed in the prospective study, specificities and likelihood ratios were calculated and included.17

RESULTS

Precision of Symptoms and Signs of Meningitis

Data on the precision of the clinical examination for meningitis were not available from the retrospective studies. In the prospective study, a single clinician completed all clinical examinations.17

Accuracy of the Clinical History in the Diagnosis of Meningitis

The individual components of the clinical history have low sensitivity for the diagnosis of meningitis, as indicated in Table 3. In addition to symptoms of headache and nausea and vomiting, neck pain was reported to have a sensitivity of 28% among patients with meningitis.22 Data from the prospective trial suggest that the clinical history also lacks specificity for the diagnosis of meningitis, with reported specificities of 15% for a nonpulsatile headache, 50% for a generalized headache, and 60% for nausea and vomiting.17 Thus, clinical history alone is not useful in establishing a diagnosis of meningitis. The inaccuracy of the clini-
Table 2. Studies Assessing Clinical Presentation of Patients

<table>
<thead>
<tr>
<th>Source, y</th>
<th>Clinical Setting, Years</th>
<th>No. of Patients</th>
<th>Age, Mean (Range), y</th>
<th>Type of Meningitis*</th>
<th>Patient Identification</th>
<th>Clinical Findings Defined</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sigurdardottir et al,‡‡ 1997</td>
<td>All hospitals in Iceland, 1975-1994</td>
<td>119</td>
<td>44% &gt;45 (16-7)</td>
<td>Bacterial</td>
<td>All patients with bacterial isolates from cerebrospinal fluid or meningococcemia, processed at national central laboratory, complete hospital records for 119 of 132 patient-episodes</td>
<td>No</td>
</tr>
<tr>
<td>Durand et al,† 1993</td>
<td>University hospital, 1962-1988</td>
<td>259</td>
<td>56%&gt;50 (16-88)†</td>
<td>Bacterial</td>
<td>Hospital diagnosis of acute bacterial meningitis, including transferred patients</td>
<td>No</td>
</tr>
<tr>
<td>Uchihara and Tsukagoshi,† 1991†</td>
<td>General hospital, dates not specified</td>
<td>34</td>
<td>38.6 (15-71)</td>
<td>Aseptic (n = 28), bacterial/tuberculous (n = 1), other§</td>
<td>Patients presenting to outpatient or emergency department with headache and fever</td>
<td>Yes</td>
</tr>
<tr>
<td>Gorse et al,‡‡ 1984‡</td>
<td>University and Veterans Affairs hospitals, 1970-1982</td>
<td>54</td>
<td>64 (50-95)</td>
<td>Bacterial</td>
<td>Patients with a discharge diagnosis of meningitis</td>
<td>No</td>
</tr>
<tr>
<td>Gorse et al,‡‡ 1984‡</td>
<td>University hospital, 1970-1982</td>
<td>32</td>
<td>(15-49)¶</td>
<td>Bacterial</td>
<td>Patients with a discharge diagnosis of meningitis</td>
<td>No</td>
</tr>
<tr>
<td>Massanari,‡ 1977</td>
<td>University hospital, 1965-1975</td>
<td>17</td>
<td>&gt;65#</td>
<td>Bacterial</td>
<td>Patients with a chart diagnosis of meningitis</td>
<td>No</td>
</tr>
<tr>
<td>Magnussen,‡ 1980</td>
<td>Community hospital, 1969-1978</td>
<td>59</td>
<td>39**</td>
<td>Aseptic (n = 34), bacterial</td>
<td>Patients with a discharge diagnosis of acute meningitis</td>
<td>No</td>
</tr>
<tr>
<td>Domingo et al,‡ 1990</td>
<td>Hospital, 1974-1988</td>
<td>59</td>
<td>71 (65-87)</td>
<td>Bacterial</td>
<td>Not indicated</td>
<td>No</td>
</tr>
<tr>
<td>Behrman et al,‡ 1989</td>
<td>University hospital, 1970-1985</td>
<td>31</td>
<td>72 (65-89)</td>
<td>Aseptic (n = 4), bacterial</td>
<td>Patients with a discharge diagnosis of meningitis, subdural empyema, brain abscess, or epidural abscess</td>
<td>Yes</td>
</tr>
<tr>
<td>Rasmussen et al,‡ 1992</td>
<td>Community hospitals, 1976-1988</td>
<td>48</td>
<td>69‡ (60-88)††</td>
<td>Tuberculous (n = 6), bacterial</td>
<td>Computer search of hospital records for patients with a diagnosis of acute bacterial meningitis</td>
<td>No</td>
</tr>
</tbody>
</table>

*Infections included in calculations of sensitivities for clinical findings.
†Community-acquired meningitis.
‡Prospective study design, assessing clinical findings compared with cerebrospinal fluid pleocytosis in patients presenting with headache and fever.
§Predominantly aseptic meningitis (25/54 patients), Other includes subarachnoid hemorrhage (n = 2), acute monocytic leukemia (n = 1), Sjögren syndrome (n = 1), upper respiratory tract infection (n = 11), infectious diarrhea (n = 3), edentulous (n = 2), glaucoma (n = 1), and not specified (n = 3).
¶Two patient groups were included in this study: 54 patients older than age 50 years and 32 patients between 15 and 49 years. Each age group is reported separately.
#Mean age not reported.
#Mean age and range not reported.
**Mean age calculated from data in study, range not reported.
††Median age.
be severely ill than normothermic patients.\textsuperscript{28}

Neck stiffness is also a relatively useful clinical finding, with a pooled sensitivity of 70% (95% CI, 58%-82%, Table 4). Other signs of meningeal irritation, namely Kernig and Brudzinski signs, have not been well studied, although in Brudzinski’s original description of 42 cases of meningitis (including 21 cases of tuberculous meningitis), Kernig sign had a sensitivity of 57%, while Brudzinski nape of the neck sign had a sensitivity of 97% and the contralateral reflex sign had a sensitivity of 66%.\textsuperscript{11} Brudzinski himself claimed to confirm the specificity of his nape of the neck sign by attempting (and failing) to elicit it in children with other neurological conditions.\textsuperscript{11} Uchihara and Tsukagoshi’s prospective study\textsuperscript{17} of younger adult patients (mean age, 39 years) reported a sensitivity of 9% and a specificity of 100% for the Kernig sign, while neck stiffness had a sensitivity of 15% and a specificity of 100%. Because this study enrolled patients presenting with fever and headache, and excluded those with mental status abnormalities or focal neurologic findings, the low reported sensitivities may result from excluding those patients with the highest likelihood of having meningeal signs.

Considering that these signs of meningeal irritation have been in use for almost a century, assessment of their accuracy has been limited. Indirect evidence of poor specificity comes from a case series of\textsuperscript{29} 74 acute-care and 287 geriatric patients (hospitalized patients in the acute-care or rehabilitation geriatric wards) aged 17 to 92 years.

### Table 3. Sensitivity of Clinical History in the Diagnosis of Meningitis

<table>
<thead>
<tr>
<th>Source, y</th>
<th>No. of Patient Episodes</th>
<th>Headache, %</th>
<th>Nausea and Vomiting, %*</th>
<th>Neck Pain, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uchihara and Tsukagoshi, 1991\textsuperscript{†}</td>
<td>34</td>
<td>27</td>
<td>32</td>
<td>NA</td>
</tr>
<tr>
<td>Gorse et al, 1984\textsuperscript{‡}</td>
<td>54</td>
<td>43</td>
<td>30</td>
<td>28</td>
</tr>
<tr>
<td>Massanari, 1977</td>
<td>17</td>
<td>41</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Magnussen, 1980</td>
<td>59</td>
<td>78</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Domingo et al, 1990</td>
<td>59</td>
<td>81</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Behrman et al, 1989</td>
<td>32\textsuperscript{§}</td>
<td>31</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Rasmussen et al, 1992</td>
<td>48</td>
<td>46</td>
<td>29</td>
<td>NA</td>
</tr>
</tbody>
</table>

Pooled sensitivity (95% confidence interval) 50 (32-68) [n = 303] 30 (22-38) [n = 136] NA

*NA indicates the clinical finding was not assessed.
†Only study patients with pleocytosis were included in the calculation of sensitivity.
‡Data reported only for patients older than 50 years.
§Thirty-one patients with 32 patient-episodes.

### Table 4. Sensitivity of the Physical Examination in the Diagnosis of Meningitis

<table>
<thead>
<tr>
<th>Source, y</th>
<th>No. of Patient Episodes</th>
<th>Fever</th>
<th>Neck Stiffness</th>
<th>Altered Mental Status</th>
<th>Fever, Neck Stiffness, and Altered Mental Status</th>
<th>Focal Neurologic Findings*</th>
<th>Rash</th>
<th>Kernig Sign</th>
<th>Jolt Pressure of Headache</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sigurdardottir et al, 1997</td>
<td>119</td>
<td>97</td>
<td>82</td>
<td>66</td>
<td>51</td>
<td>10</td>
<td>52</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Durand et al, 1993</td>
<td>279</td>
<td>95</td>
<td>88</td>
<td>78</td>
<td>66</td>
<td>29</td>
<td>11</td>
<td>97</td>
<td>NA</td>
</tr>
<tr>
<td>Uchihara and Tsukagoshi, 1991\textsuperscript{†}</td>
<td>34</td>
<td>71</td>
<td>15</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>9 \textsuperscript{e}</td>
<td>97</td>
<td>NA</td>
</tr>
<tr>
<td>Genton and Berger, 1988</td>
<td>112</td>
<td>NA</td>
<td>NA</td>
<td>32</td>
<td>NA</td>
<td>10</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Gorse et al, 1984\textsuperscript‡</td>
<td>54</td>
<td>91</td>
<td>81</td>
<td>89</td>
<td>NA</td>
<td>39</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Gorse et al, 1984\textsuperscript‡</td>
<td>32</td>
<td>75</td>
<td>66</td>
<td>53</td>
<td>NA</td>
<td>22</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Massanari, 1977</td>
<td>17</td>
<td>88</td>
<td>76</td>
<td>88</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Magnussen, 1980</td>
<td>59</td>
<td>42</td>
<td>81</td>
<td>20\textsuperscript{f}</td>
<td>NA</td>
<td>10</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Domingo et al, 1990</td>
<td>59</td>
<td>95</td>
<td>92</td>
<td>88</td>
<td>NA</td>
<td>37</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Behrman et al, 1989</td>
<td>32</td>
<td>94</td>
<td>59</td>
<td>88</td>
<td>18\textsuperscript{g}</td>
<td>NA</td>
<td>38</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Rasmussen et al, 1992</td>
<td>48</td>
<td>79</td>
<td>54</td>
<td>69</td>
<td>NA</td>
<td>21</td>
<td>4</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

Pooled sensitivity (95% confidence interval) 85 (78-91) [n = 733] 70 (58-82) [n = 733] 67 (52-82) [n = 811] 46 (22-69) [n = 426] 23 (15-31) [n = 794] 22 (1-43) [n = 446]

*All data are presented as percentage unless otherwise noted. NA indicates finding was not assessed.
†Focal neurologic findings include bilateral Babinski reflexes, pupillary abnormalities, hemiparesis, cranial nerve abnormalities, nystagmus, convulsion and/or seizure, and tremor.
‡There were 279 patient-episodes in 259 patients.
§Thirty-one patients with 32 patient-episodes.
| Only study patients with pleocytosis were included in the calculation of sensitivity.
| Specificity of 100%; Brudzinski sign was not assessed.
| Specificity of 60%.
| Two patient groups were included in this study: 54 patients older than 50 years and 32 patients between 15 and 49 years. Sensitivities were calculated separately for each age group.
| Moderate or severe alteration in mental status.
| Authors refer to this clinical finding as “meningeal signs.”
| Thirty-two patient-episodes in 31 patients.

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Acute meningitis than with aseptic meningitis are observed prospectively which patients suspected of having meningitis are assessed in this study.

Rashes occurred most frequently in the presentation of meningitis due to Neisseria meningitidis, with prevalences of 63% and 80%. Of 34 patients with meningococcemia, whereas purpura was described in only 20% of these patients. Petechial, purpuric, and ecchymotic rashes also occurred, with lower frequency, in infections caused by Haemophilus influenzae, Streptococcus pneumoniae, and Listeria monocytogenes.

Since the overall incidence of N meningitidis among patients with community-acquired bacterial meningitis was low (14% in 1 series), the pooled sensitivity of a rash for the diagnosis of meningitis was poor (Table 4). One or more focal neurologic abnormalities were described in many of the case series, including bilateral Babinski reflexes, pupillary abnormalities, hemiparesis, cranial nerve abnormalities, nystagmus, convulsion or seizure, and tremor. As summarized in Table 4, the pooled sensitivity for these signs is low, and they are not clinically useful in ruling out meningitis.

**SCENARIO RESOLUTION**

The first scenario described a 30-year-old man with chills, who complained of a stiff neck but had no fever or meningeal signs on examination. We would ask the patient about a headache, and, if present, assess for jolt accentuation. His lack of fever, normal mental status, and lack of jolt accentuation would be sufficient to assure us that this patient does not have meningitis.

In the second scenario, a 70-year-old woman presented with fever, confusion, and neck stiffness. Although we do not know the specificity of these findings, their presence causes us to suspect that she may have meningitis. To establish or refute the diagnosis in this scenario, we would proceed to definitive testing by lumbar puncture.

**THE BOTTOM LINE**

Assessment of the accuracy of the clinical examination in the diagnosis of meningitis is severely limited by the paucity of prospective data on this topic. Despite classic descriptions of meningeal signs and sweeping statements about clinical presentations in generations of textbooks, the signs and symptoms of meningitis have been inadequately studied and the conclusions of this systematic review are that more prospective research is required. Based on the limited studies included in this systematic review, we suggest the following to make optimal use of the clinical examination.

1. The absence of all 3 signs of the classic triad of fever, neck stiffness, and an altered mental status virtually eliminates a diagnosis of meningitis.

2. Fever is the most sensitive of the classic triad of signs of meningitis and occurs in a majority of patients, with neck stiffness the next most sensitive sign. Alterations in mental status also have a relatively high sensitivity, indicating that normal mental status helps to exclude meningitis in low-risk patients. Changes in mental status are more common in bacterial than viral meningitis.

3. Among the signs of meningeal irritation, Kernig and Brudzinski signs appear to have low sensitivity but high specificity.

4. Jolt accentuation of headache may be a useful adjunctive maneuver for patients with fever and headache. In patients at sufficient risk of meningitis, a positive test result may aid in the decision to proceed to lumbar puncture, whereas a negative test result essentially excludes meningitis.

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Times change and forms and their meanings alter. Thus new poems are necessary. Their forms must be discovered in the spoken, the living language of their day, or old forms, embodying exploded concepts, will tyrannize over the imagination, depriving us of its greatest benefits. In the forms of new poems will lie embedded the essences of future enlightenment.

—William Carlos Williams (1883-1963)

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