How PBL and learning issue write-ups can help students become proficient in clinical reasoning skills (*A radically clinical perspective*):

1. Working through clinical scenarios should help students gain a "big picture" understanding of how clinicians use information to achieve medicine's ultimate objective: alleviating the patient's burden of illness and restoring or maintaining wellness. For students with a basic science background from college, this represents a major shift, since in medicine scientific knowledge constitutes the means to an end, in contrast to pure science in which the knowledge is an end in itself. The application of knowledge as a means to restoring patient well-being can be an important "take-home" message of PBL at all stages of training.

2. PBL should help students develop and apply a conceptual framework for understanding different types of published information that exist, the sources where they can be found, and how they contribute to solving clinical problems. As they become familiar with different classes of clinical knowledge (background vs foreground, primary vs. secondary), students should begin to match information sources to the type of question being asked. Over time, this should lead to efficient, targeted online literature searches.

3. PBL should provide students with experience in gathering information, generating hypotheses about cause (both mechanistic and named diseases) and choosing additional tests to narrow or confirm the diagnosis. They should learn to explicitly link test results with revised hypotheses, and practice planning the next steps in investigating the cause of symptoms.

4. PBL is the principal venue in which students will have an opportunity to apply clinical reasoning skills, including the taxonomy of medical knowledge, basic probability concepts, matching source to question type, online searching, critical appraisal, and application of published evidence to specific clinical scenarios.

5. The PBL group also provides an opportunity to begin understanding teamwork, and collaborating with peers to work towards an optimal outcome for the patient.

6. Progression of PBL objectives from Year 1 to year 2: in general, the learning issues students generate during the first year will focus on normal organ or tissue function and on disease mechanisms at the ultrastructural and organ system levels. This will lead them to rely more heavily on summarized, secondary sources in researching and writing up their learning issues, but they should also sample the primary literature, both basic science and clinical. By year 2, students should become increasingly focused on the evidence about what tests and treatments are associated with superior patient outcomes. They should focus their searches on the foreground literature, become proficient in finding and critically appraising primary clinical research, and choose LIs as close as possible to the kinds of questions clinicians ask in practice.
The PBL write-up can help develop clinical reasoning skills:

1. Helps the student state the learning issue clearly, over time this should lead to the skill of “framing” clinical questions in a way that leads to specific kinds of clinical evidence.

2. Helps the student plan a search strategy based on the kind of information needed to answer the learning issue.

3. Allows the student to consider the clinical relevance of the information found, and to package the information in a way that is accessible and useful to the rest of the group.

4. Ideally, each student’s write-up should provide the others in the group with highly targeted, relevant information to the case, so that at the beginning of Day 2, everyone in the group is familiar with all of the write-ups and could discuss or present data from any of them, including their own.

The objectives listed above might be facilitated by using a structured format for the LI write ups. Here is one possible structure that could be used:

Structured Learning Issue Write-up: one possible approach

1. One to two-sentence summary of the case as of the end of Day 1, including presenting symptoms and differential diagnosis

2. Statement of the LI question, and how the information sought will contribute to the patient’s care and achieving optimal outcome, eg: help confirm the diagnosis, contribute to an understanding of the disease mechanism or process, or choose among treatment options.

3. Planned search strategy, determined by the type of information sought; for example, “Because this is a question of the mechanism by which thalassemia damages end organs, I chose a highly summarized secondary source, Harrison’s online”, or, “Because this is a question of the optimal treatment strategy for COPD, I chose to begin my search by looking for current practice guidelines at www.guideline.gov

4. Results of search: Source 1 (cite) said A, Source 2 (cite) said B, Source 3 said C.

5. One to two-sentence summary of learning issue, based on sources consulted.

6. Statement of relevance to the case, with a comment on how the clinical team caring for the patient would use the information learned to help the patient achieve an optimal outcome.