

The Diagnosis and Treatment of Musculoskeletal Infections

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Making a diagnosis is the expectation of every practicing physician. In most cases, our timely diagnosis leads to appropriate treatment and predictable outcomes. Currently, investigations must be justifiable and conclusions logical. With the high cost of health care, increased patient awareness, escalating medicolegal issues, and insurance pressures, we are held more accountable than ever before.

Our clinical reasoning starts with the acquisition of knowledge. Without knowledge, there is nothing to comprehend and without an ability to comprehend, we cannot apply knowledge in a reasonable way. For a first-year medical student, such an impeccable diagnosis seems hopelessly complex: 1) recognize and solicit meaningful signs and symptoms, 2) determine what systems are involved, 3) speculatively identify what pathologic processes are occurring, 4) differentiate one process from the other, 5) evaluate all pieces of information, and 6) anticipate the most likely course of the illness.



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The association of certain musculoskeletal infections with specific microorganisms is an evidence-based, “knee-jerk” reflex linking diagnosis and treatment: for example, *Salmonella enterica* osteomyelitis and sickle cell anemia; staphylococcal periprosthetic total joint infections; gonococcal pyarthrosis and pelvic inflammatory disease; *Clostridium speticum* gangrene in patients with carcinoma of the colon; community-acquired oxacillin-resistant *Staphylococcus aureus* wound infections in high school wrestlers.

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These infection patterns link our clinical reasoning with specific knowledge. Such reasoning may not apply in any particular case if the practitioner does not “know” enough about the clinical problem. In North America, a *Pseudomonas* infection has become synonymous with a puncture wound to the foot in children wearing tennis shoes. But, what if the same injury occurs in a barefoot child in Tobago?

In the latter case, there is a recognized pattern that does not conform to reflex reasoning. We have no specific knowledge to make the connections or inferences about the environmental implications of the injury. To move forward, we start the deductive process of setting up hypotheses and gathering data to prove or disprove the cues.

Clinical Diagnosis Starts With the Acquisition of Knowledge

With expanded travel and economic opportunity, the boundaries of the world are shrinking. Political, economic, and social issues are driving unstoppable numbers of immigrants to seek new opportunities in foreign environments, bringing with them their own unique health issues, microflora, and disease tolerances. As evidenced in China’s 2004 “bird flu” crisis, globalization has now interlocked us with the rest of the world. We must now base our diagnoses on a consideration of the dynamic internal and external environments of *any* living being.

The 5 case reports in this section of *The American Journal of*

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Orthopedics are another reminder of our ongoing need to acquire reliable knowledge about the world in which we live. Our clinical and diagnostic thinking can no longer be based on a reflexive matching of a presenting problem to a similar and previously encountered situation.

In these articles, we read of an *Echinococcus* cyst in Cairo, a *Staphylococcus lugdunensis* osteomyelitis originating in Tobago, dematiaceous fungi in Minnesota, *Salmonella enterica* in Temple, Texas, and septic arthritis due to *Gemella morbillorum* in Winnipeg, Canada.

In each case in these reports, the clinical history elicited a suspicion of infection and the need for a biopsy/culture to confirm the cue. *Adequate* and *multiple tissue samples* serve to safeguard

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the investigation. If pathogens cannot be isolated with conventional methods, saved portions of the biopsy specimens can be smeared on special culture media and cut for histologic study.

To be in medical practice is to tolerate ambiguity. Not all diagnoses are straightforward. Increasingly, unfounded diagnoses are made when practitioners use 1 or 2 symptoms to jump start a premature conclusion, never taking time to consider the totality of a patient’s presentation. The painstaking process of collecting cues to generate a diagnosis transforms an unstructured problem into a structured problem. This is the acquisition of specific knowledge. What follows is a sequential, progressive, logical reasoning to comprehend and analyze before initiating treatment. ■