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Digital Health Corner by Genie Health

Data-Driven Prognosis and Improved Outcomes Part 1: The Demands of Practice-Based Evidence

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The future of orthopedic prognosis is a discussion about information: what we need to know, when and where we can obtain it, and how we should use it to improve outcomes.

The science of diagnosis begins with our education, which includes definitions, protocols, and assessment tools. To that foundation we add applicable imaging, screens, and tests. We also lean on our clinical experience as a whole. Where those three concepts meet the individual presentation of disease, dysfunction, or injury is the formation of a diagnosis.

The art of diagnosis begins when you make an incorrect or incomplete assessment, commit to understanding the "why, how and when" of your error and choose to develop a strategy to reduce similar errors in the future. We're better for having been there but without clinical mentorship or intense scrutiny of our outcomes, how do we refine our clinical decisions?

In my case, that's the origin story of the Selective Functional Movement Assessment. The SFMA improved my clinics by offering:

1. Accuracy of diagnosis (the target), and
2. Identification of regional interdependence (the obstacles in front of the target).

Diagnostic ability and diagnostic accuracy have reached a high point with the addition of technological advancements. Most clinicians I encounter have reason to be very confident in their diagnostic abilities. More often than not, it's how we form a prognosis that leaves outcomes lacking.

How do we make a prognosis? With a diagnosis in hand, we must also consider the variables and obstacles unique to the particular case - its complicating factors.

In most cases, over the term of rehabilitation, the diagnosis will not change. The complicating factors can and will change. The pertinent questions become: Are we doing enough to be fully informed of the diagnosed and undiagnosed complicating factors that arrive with our patients? How can we be better informed of those complicating factors, their changes and their impact on the initial diagnosis, care, and prognosis?

As with the art of diagnosis, the art of prognosis is about making errors, learning from those errors and using a system to make ourselves better. For prognostic abilities, that system should focus on functional wellness - a holistic consideration of movement behaviors alongside lifestyle behaviors.

Clinical outcomes can improve if we employ a functional wellness screening mentality, considering risk associated with:

1. Undiagnosed MSK complicating factors affecting outcome,
2. Diagnosed complicating factors, outside of specialty, affecting outcome, and
3. Undiagnosed complicating factors, outside of specialty, affecting outcome.

Giving greater value to additional factors may seem unsettling, as the assumption is that diagnosis is the greater part of prognosis. Diagnosis is the *first* consideration of prognosis, but does that always make it the greatest determinant of outcome? Can complicating factors carry equal weight with the diagnosis when making a prognosis? As Hippocrates stated: *"It is more important to know what sort of person has a disease than to know what sort of disease a person has."*

Many clinicians are hesitant to consider factors outside of their diagnostic specialty, however it is logical and reasonable to screen for complicating factors of wellness that impact the outcome prediction. When risk is identified, monitor, treat, or refer as appropriate.

Consider the outcomes discussed in Rhon, et al.[1] Using the SFMA as an audit, this study tracks injury, rehabilitation and return to duty for a cohort of 449 U.S. Army soldiers.

After rehabilitation and after being cleared to return to unrestricted full duty:

- *25% did not feel fully mission capable.*
- *99.8% presented with at least 1 dysfunctional movement pattern.*
- *37.0% had dysfunction with 9 of the 10 movement patterns.*
- *44.1% had pain with at least 1 of the movements.*
- *79.5% demonstrated asymmetry with movement from side to side.*

These numbers are startling and they likely represent outcomes compromised by unaccounted-for complicating (risk) factors. Without questioning diagnostic and treatment standards, we have data confirming a generalized reduction in wellness and fitness in the military since the late

1960s. Military fitness standards have been consistently relaxed to remove physical barriers to service. As a fellow clinician, I would like to believe that the prognosis of each soldier did not include known risk factors like post-rehabilitation pain, dysfunction, asymmetry, and lack of physical confidence.

How can we better know what sort of person has the disease? If those 449 cases were the last 449 patients I had treated, I would want to know what complicating factors I had missed. Had I known, what would I have done differently at the beginning?

The use of technology can provide us more efficient and effective feedback to enhance our diagnostic and prognostic abilities. We must be willing to confront our confirmation bias and adjust our practice when the data tells us that our outcomes could and should be better.

Part two of this editorial will explore how evidence-based prognostic data can be practically and preemptively collected at scale to achieve improved outcomes.

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