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Specific role of diagnostics in optimizing patient pathways

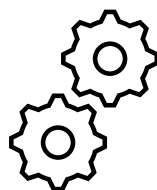
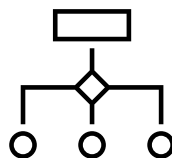
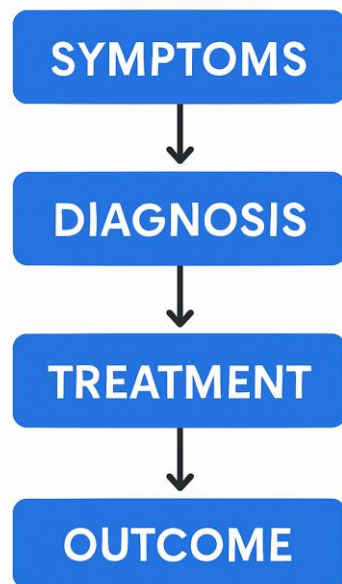
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Author's Disclosure

Artem Boltyenkov, PhD is an employee of Siemens Healthineers

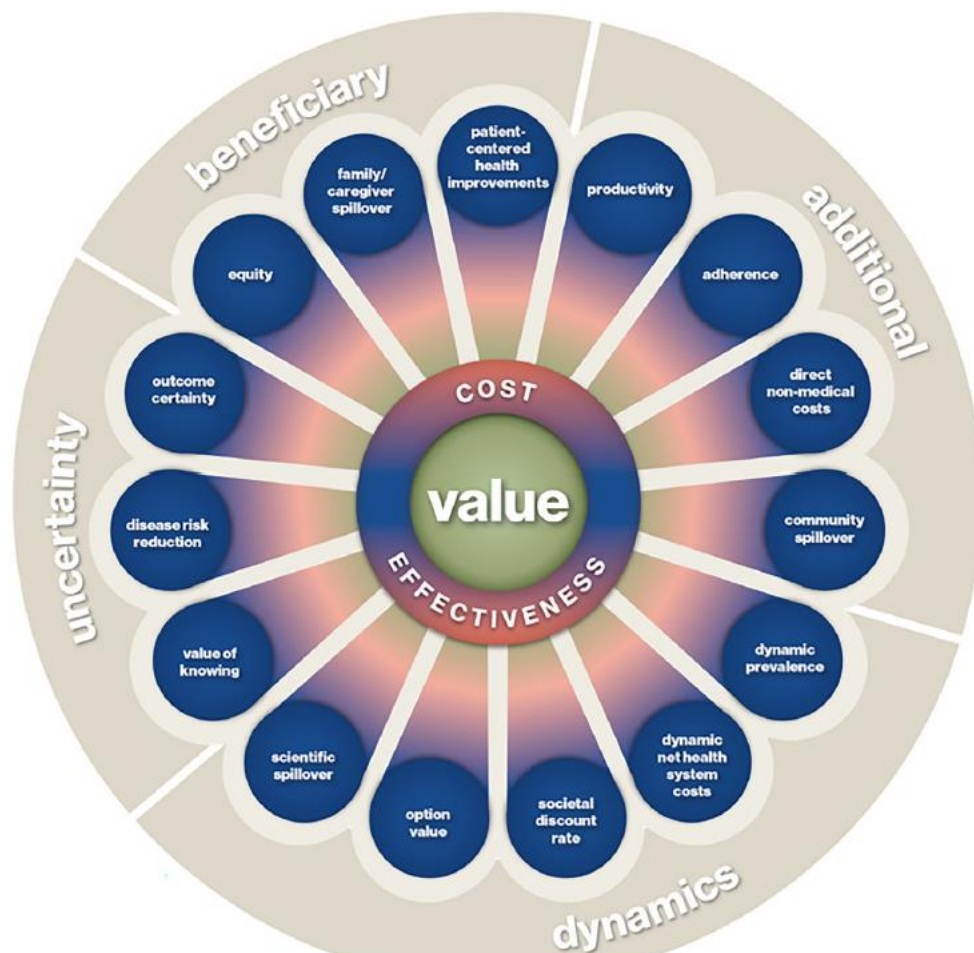
Importance of Diagnostics in Healthcare Systems

PATIENT JOURNEY



- What is the role of diagnostic patient pathways?
 - Screening
 - Diagnostic
 - Prognostic
 - Monitoring
- Why optimizing patient pathways matters: better outcomes, efficiency, cost savings.
- Technology's evolving role in reshaping care delivery.

Valuing Diagnostic Tests and Their Downstream Actions



- Dimensions of diagnostic value:
 - Uncertainty (value of hope, insurance value)
 - Dynamics (scientific development)
 - Beneficiary (caregivers, vulnerable populations)
 - Additional Value Components (productivity, adherence, societal benefits)
- Actions driven by results:
 - Positive results → Escalated care (e.g., imaging, therapy).
 - Negative results → De-escalation (e.g., monitoring, less intensive therapy).
- Economic metrics: Incremental cost-effectiveness ratio (ICER), Generalized Risk Adjusted Cost Effectiveness (GRACE), budget impact.

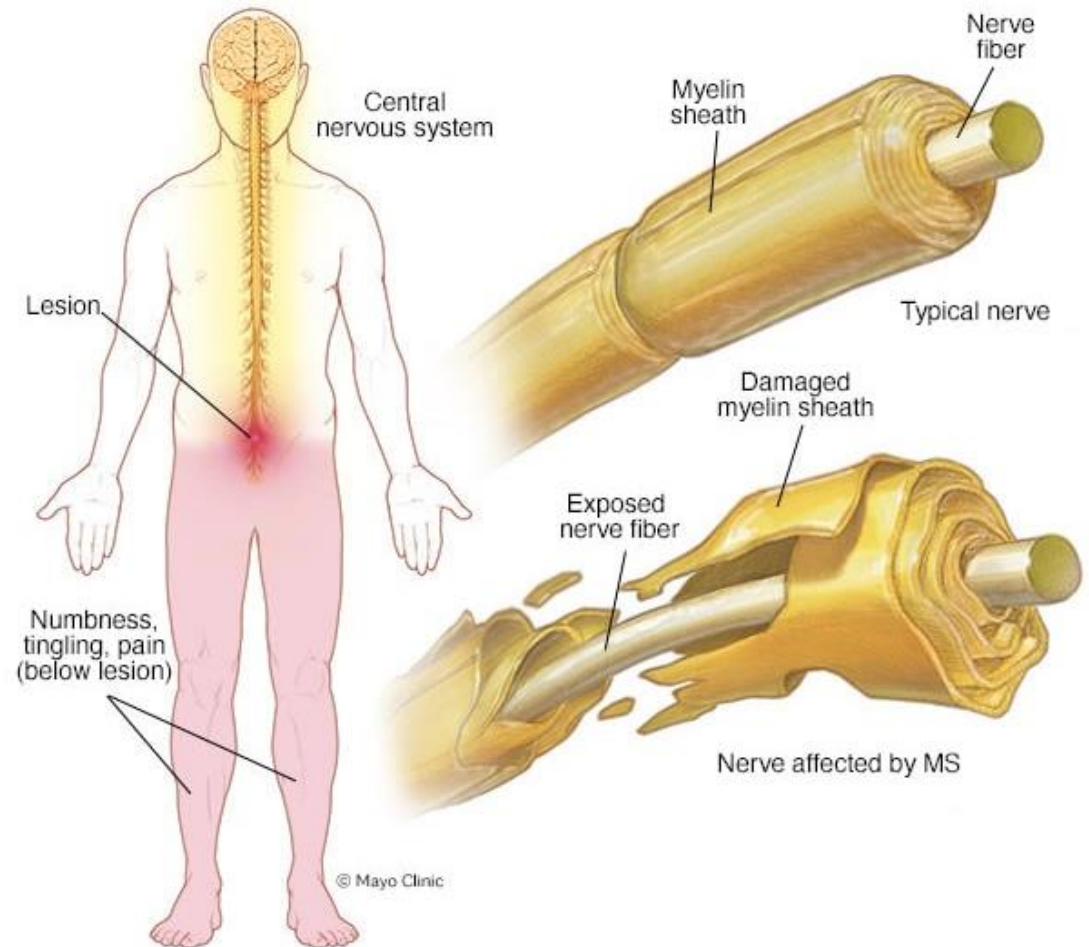
Seamless Integration of Diagnostics and Therapy

- Diagnostics inform patient-care plans:
 - Stratify patients by risk or disease activity.
 - Guide therapy selection and monitoring.
- Integration benefits:
 - Personalized care: Tailored interventions based on test results.
 - Efficiency: Reduced overtreatment, optimized resource use.
- Example: Biomarker tests for chronic diseases (e.g., multiple sclerosis).



What is multiple sclerosis?

- Multiple sclerosis (MS) is a neurological disease that affects the central nervous system (CNS)¹
- MS is thought to be an autoimmune disease. In MS, lymphocytes, which can normally distinguish between self and non-self, incorrectly recognise the myelin as foreign and proceed to attack it¹
- The loss of myelin, a key structural component of nerve cells in the brain and spinal cord, causes communication problems between the brain and the rest of the body^{2,3}



1. Multiple Sclerosis Trust. 2018. Available at: <https://www.mstrust.org.uk/about-ms/what-ms/ms-facts> [Accessed Septen
2. MS Society. What is MS? 2019. Available at: <https://www.mssociety.org.uk/about-ms/what-is-ms> [Accessed September 2019]
3. Mayo Clinic. Multiple sclerosis. Causes. 2019. Available at: <https://www.mayoclinic.org/diseases-conditions/multiple-sclerosis/symptoms-causes/syc-20350269> [Accessed September 2019]
4. Picture is from Mayo Clinic: <https://www.mayoclinic.org/diseases-conditions/multiple-sclerosis/symptoms-causes/syc-20350269>

Relapsing Multiple Sclerosis



- National Institute of Health. Doctor Patient Communication. Retrieved June 13, 2022, from <https://www.nia.nih.gov/health/doctor-patient-communication>

NFL Test for Multiple Sclerosis



- **Neurofilament Light Chain (NFL) Biomarker**

Structural protein released when neurons are damaged

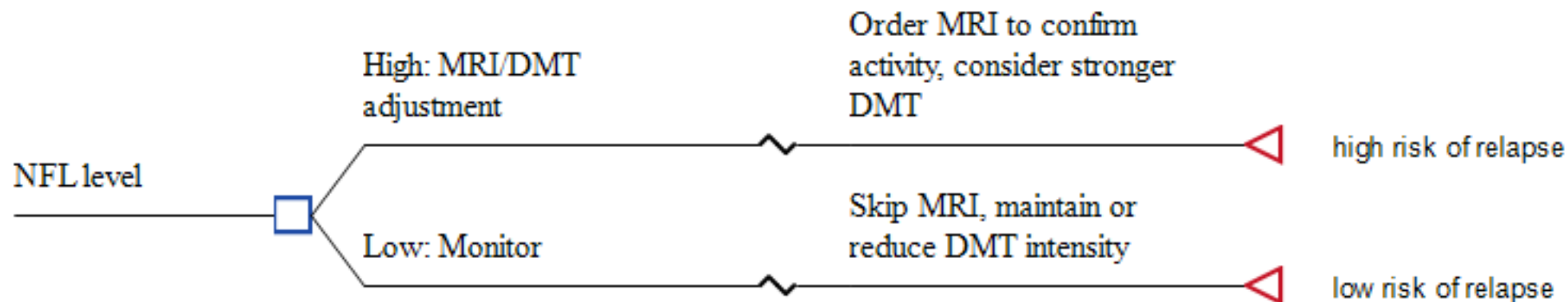
- **Simple Blood Test**

Detects neurodegenerative activity before clinical symptoms worsen

- **Early Detection, Earlier Action**

Enables proactive referrals and treatment planning

NFL Test Impact on Patient Pathway



- High NfL:
 - Action: Order MRI to confirm activity, consider stronger DMT.
 - Benefit: Targeted intervention, improved outcomes.
- Low NfL:
 - Action: Skip MRI, maintain or reduce DMT intensity.
 - Benefit: Avoided costs, reduced patient burden.
- Outcome: Optimized pathway, tailored to disease activity

NfL Testing: Economic and Clinical Benefits

- Economic impact:
 - Reduced MRI use (e.g., 30–50% fewer scans).
 - Optimized DMT use, lowering long-term costs.
- Clinical impact:
 - Timely interventions for high-risk patients.
 - Reduced overtreatment for stable patients.
- Valuation: High ICER, favorable budget impact for payers.



Diagnostics: The Future of Efficient Care Pathways

- Diagnostics optimize patient pathways by:
 - Valuing tests through outcomes and cost-effectiveness.
 - Integrating results with personalized care plans.
- NfL test for MS: A blueprint for precision and efficiency.
- Call to action: Invest in diagnostic innovation for sustainable healthcare.

