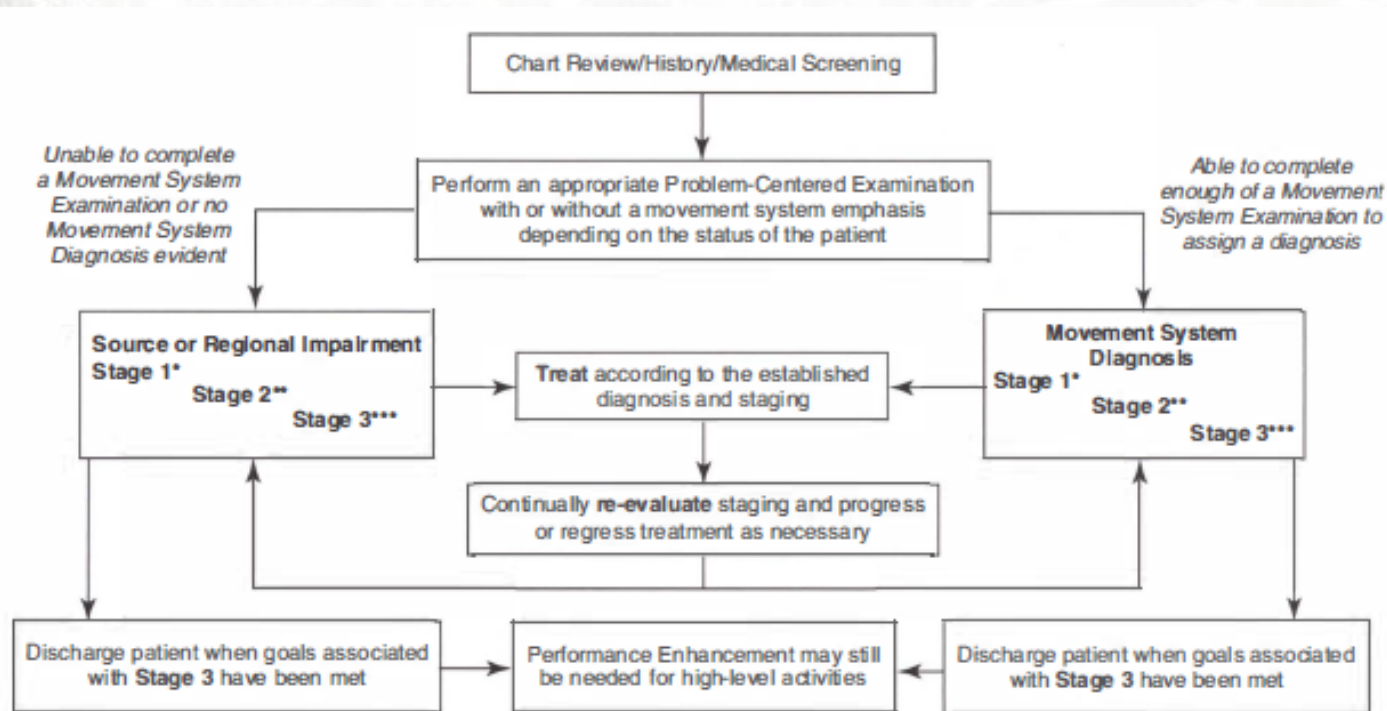
The background of the slide is a photograph of a winter forest. In the foreground, a large, snow-laden tree trunk and its branches are visible. The branches are covered in a thick layer of white snow. In the background, there are more trees, some with snow on their branches and others without. The ground is covered in a layer of snow. The overall scene is a peaceful winter landscape.

# **Movement System Impairment of the Extremities, Cervical and Thoracic Spines**

**Chapter 2: Staging  
System for Rehabilitation**





\*Stage 1: Low threshold for injury, or high tissue irritability. Symptoms, precautions, and restrictions limit examination and treatment. Levels of stress to affected tissues should be minimal.

\*\*Stage 2: Moderate threshold for injury. Precautions and restrictions may still be in place, but treatment should begin to emphasize progression of appropriate physical stress to targeted tissues.

\*\*\*Stage 3: High threshold for injury, or low tissue irritability. Treatment should emphasize tissue adaptation and hypertrophy. Generally, precautions have been lifted. Focus on return to work and higher level sport activities.

**Figure 2-1.** General diagrammatic representation of the diagnostic process. According to the physical stress theory, the stages used within the flow chart can generally be defined by stress restriction/progression. Staging should continually be evaluated.



**TABLE 2-1**  
**Variables Used to Determine Stage for Rehabilitation**

<b>Variable</b>	<b>Stage 1</b>	<b>Stage 2</b>	<b>Stage 3</b>
Time since injury	Recent	—	Remote
Symptoms	↑Severity ↑Irritability	—	↓Severity ↓Irritability
Outcome scores	Low-level function ↑Disability	Medium-level function	High-level function ↓Disability
Functional mobility	↓Use of segment in function	Segment used in function, not optimal	↑Optimal use of segment in function



**TABLE 2-2**  
General Key Tests and Assessments for Staging

Stage 1	Stage 2	Stage 3
<ul style="list-style-type: none"> <li>• Low threshold for injury or high tissue irritability.</li> <li>• Symptoms/precautions/restriction limit examination and treatment.</li> <li>• Levels of stress to affected tissues should be minimal.</li> </ul>	<ul style="list-style-type: none"> <li>• Moderate threshold for injury.</li> <li>• Precautions/restrictions may still be in place, but treatment should begin to emphasize progression of appropriate physical stress to targeted tissues.</li> </ul>	<ul style="list-style-type: none"> <li>• High threshold for injury or low tissue irritability.</li> <li>• Treatment should emphasize tissue adaptation/hypertrophy. Generally, precautions have been lifted.</li> <li>• Focus on return to work/higher level sport activities.</li> <li>• Emphasis of treatment is placed on gradually increasing stress to the tissues to restore to optimal level of function.</li> </ul>
<p><b>PRECAUTIONS</b></p> <ul style="list-style-type: none"> <li>• Check physician's orders and protocols. Assess patient's ability to adhere to precautions.</li> <li>• No resisted testing according to precautions.</li> <li>• Assess immobilization requirements.</li> </ul>	<ul style="list-style-type: none"> <li>• Check physician's orders and protocols for changes in precautions. Assess patient's ability to adhere to precautions.</li> <li>• Precautions and/or restrictions may be lessened.</li> </ul>	<ul style="list-style-type: none"> <li>• Check physician's orders and protocols for changes in precautions. Assess patient's ability to adhere to precautions.</li> <li>• Precautions likely to be lifted.</li> <li>• Resisted testing as allowed by precautions.</li> </ul>
<p><b>SYSTEMIC SIGNS/SYMPTOMS</b></p> <ul style="list-style-type: none"> <li>• Vital signs: Monitor with position changes. Heart rate may be increased secondary to pain.</li> <li>• Constitutional symptoms: Assess for signs of infection, including temperature changes.</li> </ul>	<ul style="list-style-type: none"> <li>• Vital signs: Monitor response to progression of activity.</li> </ul>	<ul style="list-style-type: none"> <li>• Vital signs: Monitor response to increasing levels of activity/exercise.</li> <li>• May have reduced tolerance of aerobic activities.</li> </ul>
<p><b>PAIN</b></p> <ul style="list-style-type: none"> <li>• Assess location and intensity of pain at rest and with movement.</li> <li>• Assess regimen of analgesics.</li> <li>• Pain may be severe at this stage (6-10/10).</li> </ul>	<ul style="list-style-type: none"> <li>• Assess location and intensity of pain at rest and with movement.</li> <li>• Pain management should be improving and intensity of pain should be less severe (3-6/10).</li> </ul>	<ul style="list-style-type: none"> <li>• Assess location and intensity of pain at rest and with movement.</li> <li>• Pain should be minimal at this stage (0-3/10).</li> </ul>
<p><b>NEUROLOGICAL STATUS</b></p> <ul style="list-style-type: none"> <li>• Establish baseline after all surgical procedures, particularly of the spine.</li> <li>• May report neurological symptoms secondary to injury or surgery, such as constant pain, numbness, and tingling, or motor loss, which may significantly limit functional activity performance.</li> </ul>	<ul style="list-style-type: none"> <li>• Monitor for change in status.</li> <li>• Activity tolerance is still limited, but neurological symptoms have improved enough to allow for progression of exercise and activity.</li> </ul>	<ul style="list-style-type: none"> <li>• Monitor for change in status.</li> <li>• Neurological symptoms should be intermittent at worst and manageable with correct movements and postures. Activity no longer limited by neurological symptoms.</li> </ul>
<p><b>FUNCTION</b></p> <ul style="list-style-type: none"> <li>• Assess patient's ability to perform functional activities while maintaining precautions and proper movement pattern. Education may need to be provided before assessment.</li> <li>• Significant limitations in functional abilities noted. May require external assistance for completion of activities.</li> </ul>	<ul style="list-style-type: none"> <li>• Assess patient's ability to perform functional activities as precautions change and movement patterns are more evident.</li> <li>• Patient able to perform most functional activities but is limited by symptoms.</li> </ul>	<ul style="list-style-type: none"> <li>• Assess patient's ability to participate in higher level activities.</li> <li>• Sport-specific activities.</li> <li>• Work-specific activities.</li> <li>• No limitations noted in the ability to perform required functional activities. Patient may be limited in the intensity or duration of functional activity performance.</li> </ul>





TABLE 2-2

General Key Tests and Assessments for Staging—cont'd

Stage 1	Stage 2	Stage 3
<b>ALIGNMENT</b>		
<ul style="list-style-type: none"> <li>Assess alignment and resting position.</li> <li>Assess need for equipment.</li> <li>Assessment may be limited secondary to precautions or restrictions.</li> </ul>	<ul style="list-style-type: none"> <li>Assess alignment and resting position within the context of a movement system examination.</li> <li>Poor alignment may be noted secondary to injury, surgery, or immobilization. Structural changes should be considered.</li> </ul>	<ul style="list-style-type: none"> <li>Assess alignment and resting position within the context of a movement system examination.</li> <li>Poor alignment may be noted secondary to injury, surgery, or immobilization. Structural changes should be considered.</li> </ul>
<b>APPEARANCE</b>		
<ul style="list-style-type: none"> <li>Incision or portal may be present. Note the amount and type of drainage.</li> <li>Note the location, mobility, and sensitivity of the scar if incision is healed. Initially, scar may be hypersensitive and restricted.</li> <li>Assess for bruising and edema. Bruising and edema will likely be significant.</li> <li>Note the location and amount of muscle atrophy. Common following immobilization.</li> </ul>	<ul style="list-style-type: none"> <li>Incision or portal should be healed though some scabbing may still be present.</li> <li>Scar should be less hypersensitive but may still be restricted with regard to mobility.</li> <li>Bruising and edema present, but fluctuating.</li> <li>Muscle atrophy still likely to be significant.</li> </ul>	<ul style="list-style-type: none"> <li>Incision/portal should be well healed.</li> <li>Scar should be soft and supple.</li> <li>Edema, bruising, and atrophy may still be present, but no longer limiting function.</li> </ul>
<b>PALPATION</b>		
<ul style="list-style-type: none"> <li>Perform when incision has healed.</li> <li>May be acutely painful and diffuse.</li> </ul>	<ul style="list-style-type: none"> <li>Should be able to palpate on and around incision site or area of injury. Pain may be more localized. May still have some hypersensitivity around incision.</li> </ul>	<ul style="list-style-type: none"> <li>Incision/portal site should be mobile and supple.</li> <li>Minimal pain (0-3/10) should be noted with palpation.</li> </ul>
<b>ROM</b>		
<ul style="list-style-type: none"> <li>Assess involved joint and adjacent joints PROM and AROM (within precautions).</li> <li>PROM and AROM likely to be limited and painful. Edema may contribute to loss of ROM.</li> </ul>	<ul style="list-style-type: none"> <li>Assess involved joint and adjacent joints PROM and AROM (within precautions).</li> <li>PROM and AROM may still be short of functional or normal ROM. Pain and tissue stiffness still limiting factors.</li> </ul>	<ul style="list-style-type: none"> <li>Assess involved joint and adjacent joints PROM and AROM (within precautions).</li> <li>AROM/PROM should be full or progressing as expected. Generally no ROM precautions.</li> </ul>
<b>MUSCLE PERFORMANCE (RECRUITMENT/STRENGTH)</b>		
<ul style="list-style-type: none"> <li>Assess involved and surrounding musculature.</li> <li>Resisted tests may be limited secondary to precautions and restrictions or pain.</li> <li>Significant deficits in muscle performance likely noted in both involved and surrounding musculature, which limits functional activity performance.</li> </ul>	<ul style="list-style-type: none"> <li>Consider movement impairments and assess involved and surrounding musculature as needed.</li> <li>Deficits in muscle performance likely. Pain may still be present with testing. Muscle performance may limit the intensity and duration of functional activity performance.</li> </ul>	<ul style="list-style-type: none"> <li>Consider movement impairments and assess involved and surrounding musculature as needed.</li> <li>Muscle recruitment may still be deficient for higher-level sport or work activity. Deficits in muscle strength likely still noted.</li> </ul>

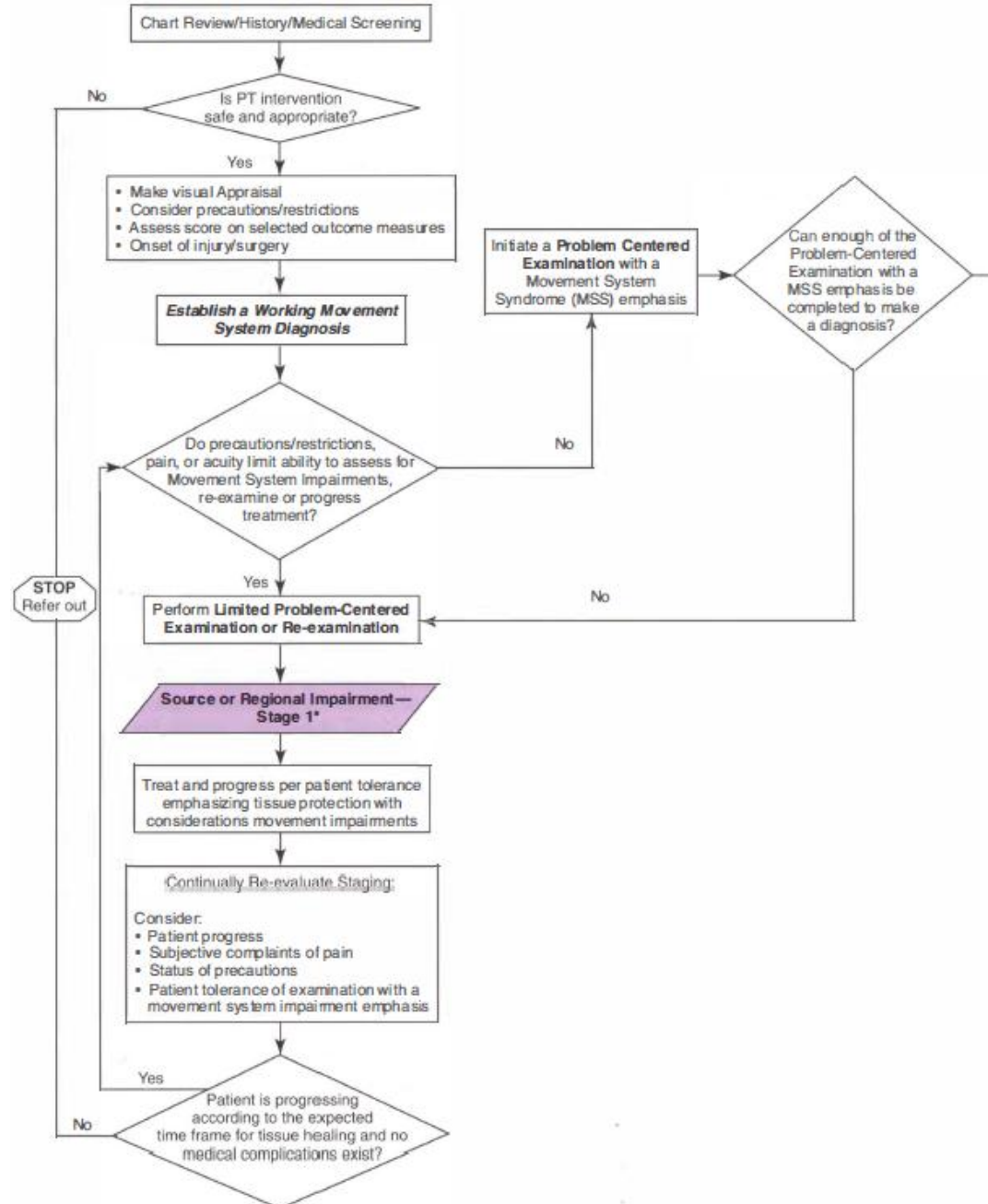


**TABLE 2-3**  
Examples of Naming Process\*

Source/Physician's Diagnosis or Presenting Problem	Surgical Procedure Performed	Able to Determine MS Diagnosis	Unable to Determine MS Diagnosis or No MS Diagnosis Evident
Rotator cuff tear	Rotator cuff repair	Scapular downward rotation, s/p rotator cuff repair, Stage 3	Rotator cuff tear, s/p rotator cuff repair, Stage 1
Shoulder pain	None	Scapular downward rotation and humeral anterior glide, Stage 2	Shoulder impairment, Stage 1
Nonspecific low back pain	None	Lumbar rotation, Stage 2	Lumbar spine impairment, Stage 1
L4-L5 disc herniation	Lumbar fusion	Lumbar flexion, Stage 1	L4-L5 disc herniation, s/p lumbar fusion Stage 1
Acetabular labral tear	Labral repair	Femoral anterior glide, s/p labral repair, Stage 2	Labral tear, s/p labral repair, Stage 1
Hip osteoarthritis	Total hip arthroplasty	Femoral hypomobility, Stage 3	Hip osteoarthritis, s/p total hip arthroplasty, Stage 2
Knee pain	Arthroscopic knee surgery removal of loose bodies	Tibiofemoral rotation, s/p arthroscopic knee surgery for removal of loose bodies, Stage 2	Knee impairment, s/p arthroscopic knee surgery for removal of loose bodies, Stage 1
Ankle sprain	None	Supination (ankle/foot), Stage 2	Ankle sprain, Stage 3

MS, Movement system; s/p, status-post.

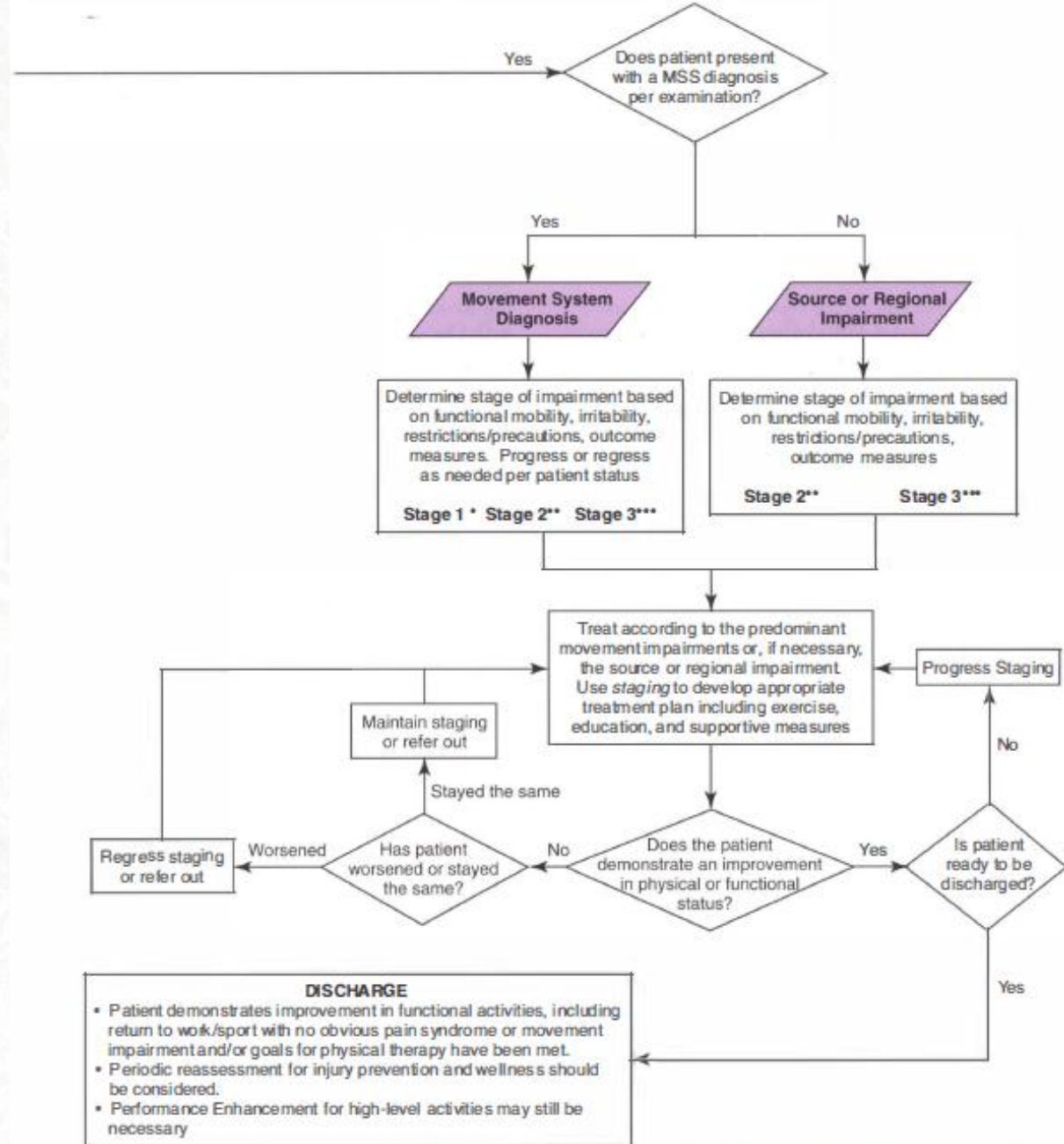
\*Diagnostic labels used to describe the status of a patient's movement system after an examination using the diagnostic process described in Figure 2-2.



\*Stage 1: Low threshold for injury, or high tissue irritability. Symptoms, precautions, and restrictions limit examination and treatment. Levels of stress to affected tissues should be minimal.

Figure 2-2. The movement system evaluation process. According to the physical stress theory, the stages used within the flow chart can generally be defined by stress restriction/progression. Staging should continually be evaluated. *PT*, Physical therapy.





**\*\*Stage 2: Moderate threshold for injury.** Precautions and restrictions may still be in place, but treatment should begin to emphasize progression of appropriate physical stress to targeted tissues.

**\*\*\*Stage 3: High threshold for injury, or low tissue irritability.** Treatment should emphasize tissue adaptation and hypertrophy. Generally, precautions have been lifted. Focus on return to work and higher-level sport activities.