Definition
Perfusion refers to the flow of blood through arteries and capillaries, delivering nutrients and oxygen to cells and removing cellular waste products.

Goals for This Concept Presentation
1. Define and describe the concept.
3. Recognize when an individual has compromised perfusion.
4. Provide appropriate nursing and collaborative interventions to optimize perfusion.

Other Key Terms
Collaborative Learning #1
In your learning group, discuss the meaning of the listed key terms and their link to the concept definition.
- Ischemia
- Infarction
- Anoxia

Define and Describe the Concept of perfusion

Scope of Concept
Categories of Perfusion

Central Perfusion
- Force of blood movement generated by cardiac output
- Requires adequate cardiac function, blood pressure, and blood volume
- Cardiac output (CO) = Stroke volume X Heart rate

Tissue or Local Perfusion
- Volume of blood that flows to target tissue
- Requires patent vessels, adequate hydrostatic pressure, and capillary permeability

Consequences:
Impaired Central Perfusion
- Impairment of central perfusion occurs when cardiac output is inadequate.
- Reduced cardiac output results in a reduction of oxygenated blood reaching the body tissues (systemic effect).
  - If severe, associated with shock
  - If untreated, leads to ischemia, cell injury, and cell death

Risk Factors:
Populations at Greatest Risk
Impaired perfusion can potentially occur among all individuals, regardless of age, gender, race, or socioeconomic status. The populations at greatest risk are:
- Middle-aged and older adults
- Men
- African Americans

Consequences:
Impaired Tissue (Local) Perfusion
- Impairment of tissue perfusion is associated with loss of vessel patency or permeability, or inadequate central perfusion
- Results in impaired blood flow to the affected body tissue (localized effect)
  - Leads to ischemia and, ultimately, cell death if uncorrected

Individual Risk Factors

Collaborative Learning #2
In your learning groups, create a list of individual risk factors and health conditions associated with impaired perfusion, and include a rationale. Indicate whether the risk factor is modifiable, also.

<table>
<thead>
<tr>
<th>Risk Factors and Health Conditions</th>
<th>Rationale</th>
<th>Modifiable? (Yes or No)</th>
</tr>
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Recognize when an individual has compromised perfusion

Two-Minute Breakout: Identifying Optimal Perfusion

- Consider the person sitting next to you. What evidence do you have that he or she has optimal central perfusion?
  - Make a list of the findings that support your assessment
- How would you determine if he or she has optimal tissue perfusion in the lower extremities?
  - Make a list of examination techniques you would use to validate optimal tissue perfusion

Recognizing Impaired Perfusion

Collaborative Learning #3

1. In your learning groups, create a list of common symptoms and clinical findings associated with impaired central and tissue perfusion.
2. Discuss why each symptom or clinical finding occurs from a physiologic perspective.

Common Diagnostic Tests

- Laboratory tests
  - Creatine kinase, lactic dehydrogenase, natriuretic peptides, troponin, homocysteine, C-reactive protein, serum lipids, platelets, prothrombin time (PT), partial thromboplastin time (PTT), international normalized ratio (INR)
- Electrocardiogram (EKG)
- Cardiac stress tests
  - Exercise or pharmacologic test
- Radiographic studies
  - Chest x-ray, ultrasound, arteriogram

Provide appropriate nursing AND collaborative interventions to optimize perfusion

Clinical Management: Primary Prevention

- Smoking and nicotine cessation
- Diet
- Exercise
- Weight control
**Concept: Perfusion**

**Clinical Management: Screening**
- Blood pressure screening
- Lipid screening

**Questions:**
1. At what age should blood pressure screening begin? How often should blood pressure screening occur?
2. Who should have lipid screening? How often?

**Clinical Management: Collaborative Interventions**
- Treatment strategies depend on underlying condition
- The most common strategies include:
  - Diet modification and smoking cessation
  - Increased activity (conditioning)
  - Pharmacotherapy

**Pharmacotherapy: Impaired Tissue (Local) Perfusion**
- Anticoagulants
- Thrombolytics
- Lipid-lowering agents
- Vasodilators
- Antiplatelet agents and platelet inhibitors

**Other Collaborative Interventions**

<table>
<thead>
<tr>
<th>Central Perfusion</th>
<th>Tissue (Local) Perfusion</th>
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<tbody>
<tr>
<td>Pacemaker insertion</td>
<td>Bypass and/or graft surgery</td>
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<tr>
<td>Electrical cardioversion</td>
<td>Stent or angioplasty</td>
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<tr>
<td>Ablation therapy</td>
<td>Endarterectomy</td>
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<tr>
<td>Intraaortic balloon pump</td>
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<tr>
<td>Cardiac valve surgery</td>
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<tr>
<td>Cardiac transplant</td>
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</table>

**Pharmacotherapy: Impaired Central Perfusion**
- Antihypertensives
- Antiarrhythmics
- Inotropics
- Antianginal agents
- Vasopressors
- Vasodilators

**Interrelated Concepts**
- Gas exchange
- Pain
- Clotting
- Cognition
- Mobility
- Elimination
- Inflammation
- Patient education
Exemplars

Collaborative Learning #4

- In your learning group, brainstorm for 3 minutes and list all the medical conditions you can think of that cause impaired perfusion for infants and children, adolescents, pregnant women, adults, and older adults.
- Indicate if the exemplar represents primarily a central or tissue perfusion impairment.