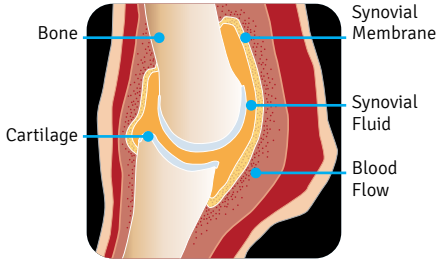


# Understanding Joint Disease

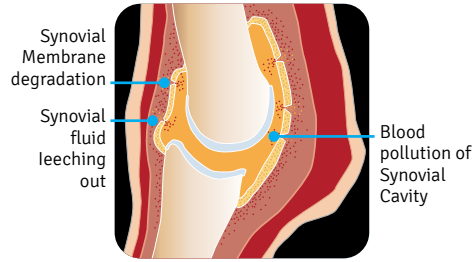


## The basic structures of a healthy joint

**Cartilage:** a unique structure which covers the end of bones in joints. Cartilage can absorb both shear and compressive forces.

**Synovial membrane:** A permeable structure which allows the flow of nutrients to and waste products from the synovial fluid

**Synovial Fluid:** The “suspension oil” of the joint. Thick and viscous, it aids the absorption of compressive forces and provides nutrients for cartilage and synovium cells.

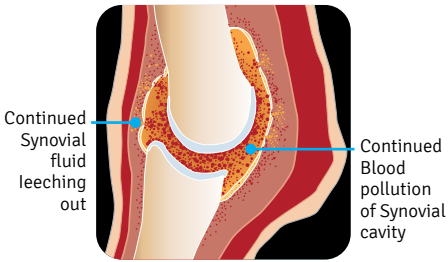


## Stage 1: The beginnings of joint disease

From trauma, noxious disease or wear and tear, inflammation of the synovial membrane (synovitis) is common in early stages of osteoarthritis. Synovitis is characterized by:

- Thickening of the lining layer
- Inflammatory cell infiltration
- Increased vascularity

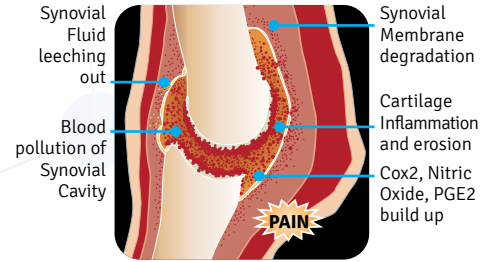
### The inflammatory cascade has now commenced within the joint.



## Stage 2: Changes within the joint beginning to occur

As osteoarthritis progresses:

- Further inflammation and degradation of the synovial membrane is the pivotal step to cartilage damage
- The increased production of inflammatory enzymes begins to break down cartilage matrix.
- Osteophyte (bone spurs) growth may also be present.
- Increased concentration of pollutants within the synovial fluid creates additional stress on the cartilage and synovial membrane cells
- The once thick and viscous joint fluid begins to lose its compressive properties and may leech out of the joint capsule
- The joint becomes hot, swollen and painful



## Stage 3: Moderate to Severe joint disease – PAIN!

As the disease progresses further:

- Obvious erosion of the cartilage matrix and narrowing of the joint space
- Osteophyte formation is more pronounced
- Chronic release of inflammatory chemicals further degrades the joint structures
- Reduction in synovial fluid production and quality creates friction in the joint
- Extreme pain is felt along with reduction of joint range of movement

## How 4CYTE™ products work

- ✓ Promotes synovial membrane viability to re-establish quality synovial fluid filtration.
- ✓ Through improved filtration, pollutants that affect cartilage’s ability to interact with synovial fluid to remain healthy are reduced.
- ✓ Enables chondrocytes to remain viable and proliferate (slowing degeneration process).
- ✓ Provides potent anti-inflammatory support to reduce physical symptoms and disease progression.

• Information for educational purposes only.

