



**ANKARA UNIVERSITY**  
**FACULTY OF VETERINARY MEDICINE**  
**DEPARTMENT OF ANATOMY**



# Anatomic Fixation & Perfusion Methods For Various Specimens

**Assoc.Prof. Okan EKİM**

# What is Fixation?

- Fixation is the process of displacing body fluids in tissues and organs with formaldehyde and similar fixative chemicals and preserving the specimens for a long time in order to prevent decomposition.
- Fixation can be performed with various techniques
- Anatomic specimen can be directly immersed to the fixative chemical.
- Fixative agent can be injected to the specimen from various points.
- Or (if specimen is quite large) perfussion can be performed for fixation.



# For Fixation Process

- Hydrophilic chemicals, mostly formaldehyde, alcohol, etc., are generally used for fixation.
- Formaldehyde is not only an irritant but also a toxic chemical.
- The necessary precautions must be taken before use. Proper ventilation, mask, gloves, glasses etc.
- Unfortunately, formaldehyde is used almost in every industry.



Assoc.Prof. Okan EKİM

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# What is Anatomic Perfusion?

- Fastest microorganism activity happens in the blood in the animal body after death.
- In order to delay decomposition and putrefication and to prepare a good cadaver specimen, all the body fluids, especially the blood should be drained out from the body.
- In various fields of human and veterinary medicine perfusion process is performed. Surgical operations, dialysis etc.
- But anatomical perfusion is a different the process. Draining out of blood from a spesific vessel and then injecting of fixative chemicals via the blood vessels again.
- Formaldehyde, alcohol, Kinnamon solution, Berliner sol. etc. a wide variety of chemicals can be used.



Assoc.Prof. Okan EKİM

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# Preparing A Cadaver With The Prefusion Method

- Died animals or deep anesthetized animals for the euthanasia process with the ethical consent should be used as subjects.
- Common carotid artery or femoral artery should be dissected out.
- **If the animal is alive**; an intravenous (I.V.) injection of anticoagulant chemical should be performed in order to prevent blood clotting.
- Then an arterial incision is made and the blood is drained out from the common carotid artery.
- After a while, a small incision should be made to the jugular vein, nearby the artery. Therefore, excess blood can be drained out from the related vein also.



# Preparing A Cadaver With The Prefusion Method

- Following the draining of blood from the artery and the vein, physiological saline solution (PSS / 0.9% NaCl) can be started to be released from the common carotid artery.
- The process continues until the PSS arrives clear and transparent from the jugular vein.
- The appropriate amount of fixative (mostly formalin) solution is delivered to the body at a certain pressure from the common carotid artery.
- After a while jugular vein should be closed to prevent the outflow of the fixative.



# Preparing A Cadaver With The Prefusion Method

- **If the animal has already died;** The common carotid artery is opened with a small incision either.
- Blood in the arterial system should be removed with a powerful perfusion pump provides negative pressure (vacuum).
- Then the jugular vein nearby the artery should be opened with an incision.
- Physiological saline (PSS) is started to be released from the artery in which the blood had been previously vacuumed.
- The process continues until the PSS arrives clear and transparent from the jugular vein.
- The appropriate amount of fixative (mostly formalin) solution is delivered to the body at a certain pressure from the common carotid artery.
- After a while jugular vein should be closed to prevent the outflow of the fixative.



# Preparing A Cadaver With The Prefusion Method

- The cadaver should be kept in a room (below 15 C°) for 24 hours.
- Afterwards, specimens should be submerged to the fixative solutions in the pools to prevent external deterioration
- In some techniques specimens can be wrapped in cloths containing fixative chemicals.
- Fixative chemicals in the pools should have the same content as the chemical given to the body
- If possible, the pools should be fixed at + 4 ° C.



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# Specimens Preserved in Fixative Solutions and Preparation Procedures

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# Anatomic Specimens in Glass Containers

- Any type of anatomical or pathological specimens (tissue, organ, system, etc.) which is placed into the glass containers consisting fixative agents for the purpose of education or demonstration.
- The basic property of the fixative solutions in the containers is to delay the microbial activity (and decomposition) by displacing with the body fluids in the sample.
- Anatomic specimen should be small enough. Therefore the external fixation can be adequate for the specimen.
- A body part, an organ, or an entire body if the sample is small.



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# Anatomic Specimens in Glass Containers

- Fixative agents or solutions. To prevent or delay decomposition of the sample.
- Formaldehyde (formalin) solution, alcohol, Hamdi-Suat solution, many modified preservative solutions.
- The size of the specimen to be exhibited is small enough to put directly into the solution.
- But if the sample is larger to be placed directly . An injection of fixative solution from various points should be made. Thus, the fixative can affect the inner parts more efficiently.
- Fixation process can take 24 hours to 1 week.
- The proper maintenance of specimen is very vital for the expiration date.
- Changing of the solution periodically is important.



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# Thank you for your attention...



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