

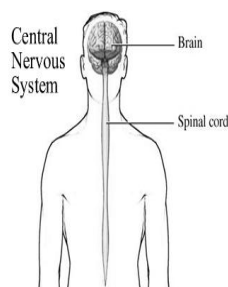
The Plastinating Process and the Educational Advantages of Long-Term Preservation of Prosections

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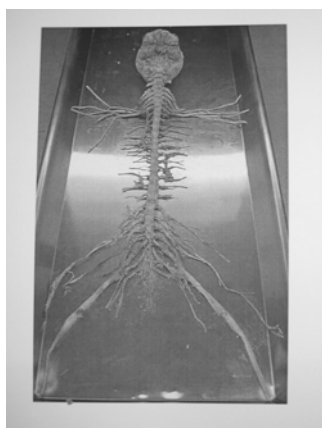
European Congress on Physiotherapy Education

History



- Dream of harvesting the Central Nervous System as a whole specimen

Reality: A Harvested CNS



Challenge

- Preserve the specimen on a long-term basis
- Answer: Plastination

What is Plastination?

- PLASTINATION is a unique technique of tissue preservation
- water and lipids in biological tissues are replaced by curable polymers (silicone, epoxy, polyester) which are subsequently hardened, resulting in dry, odorless and durable specimens.

A Plastinated Specimen is

- Dry
- Clean
- Odorless
- Durable

A Plastinated Specimen is

- Non-toxic
- Non carcinogenic
- Requires no special care or storage

Plastination is...

- Relatively simple to do
- Economical
- Done with commonly available components

Why Plastinate?

- Accurate Human Tissue Representation
- Dry, Durable and Flexible Models
- Time Efficient- valuable anatomy dissections can be preserved

Materials

- Explosion-proof freezer
- Vacuum chamber
- Vacuum pump
- Vacuum control unit
 - Vacuum gauge
 - Control valve
 - Nanometer
 - Bypass valve

Fixation

- Recommended as it makes tissue firm and reduces shrinkage
- Fixative most commonly used is a 5-20% formalin solution
- Specimens may be fixed for several days to weeks at room temperature

Flushing

- Specimen thoroughly washed by rinsing in flow of cold water for 12-72 hours
- Includes cooling tissue down to 5° C if it is not already at that temperature

Dehydration

- Goal: To replace water and fat content of specimen with polymer
- How? By first dehydrating tissue and adding a volatile intermediary solvent: acetone

Dehydration

- Utilize FREEZE SUBSTITUTION METHOD
- Specimen immersed in -20° C to -25° C bath of 100% acetone
- Recommended that ratio of specimen weight to volume of acetone be 1:10

Dehydration

- Entire dehydration process takes 3-5 weeks, depending on specimen
- Removal of tissue lipids, termed degreasing or de-fatting, occurs concurrently during dehydration

Forced Impregnation

- Central step in plastination
- Immerse specimens in polymer mixture
- Applying a vacuum force causes acetone to be replaced by the polymer
- Approximate time frame is 3 weeks

Curing

- Place in gas curing chamber at room temperature
- Gas cure vaporizes, coats the specimen's surface and seals the polymer inside
- Approximate time frame is 2 to 4 days

Final Curing and Treatment

- Place specimen in a sealed plastic container
- Specimen is usually completely infiltrated and dry to touch within 2 to 3 weeks

Final Curing and Treatment

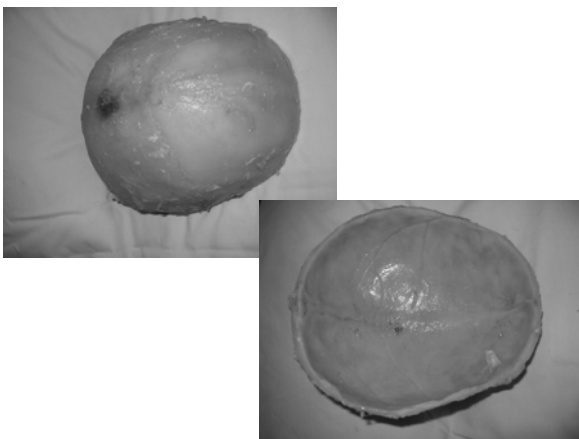
- Store in a dry, well-ventilated area for final absorption and evaporation
- Will be odorless and completely finished after 2-3 more weeks
- Ready for handling and slicing

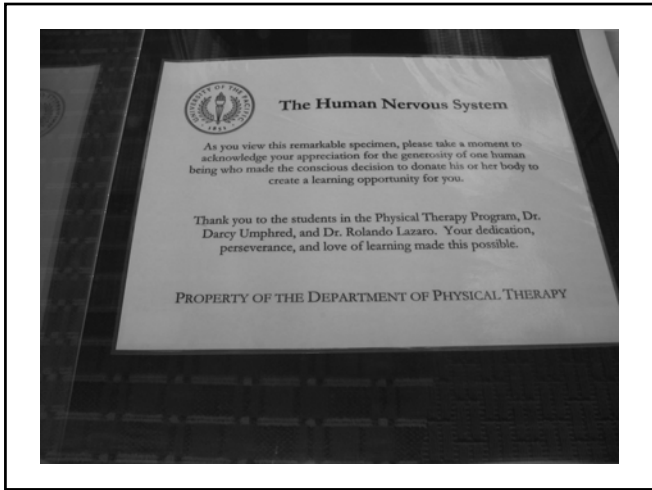
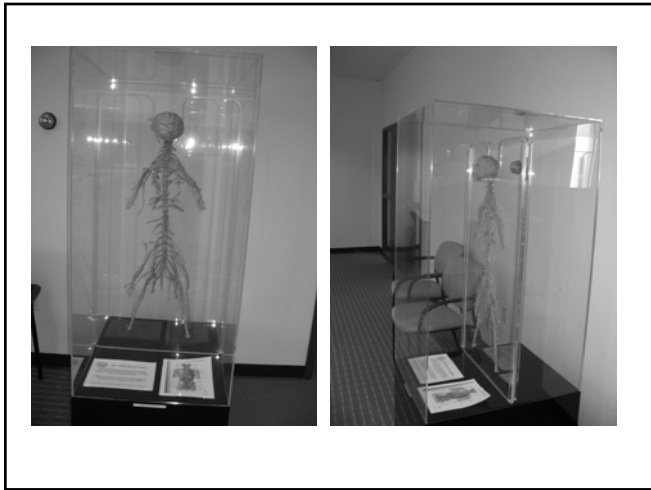
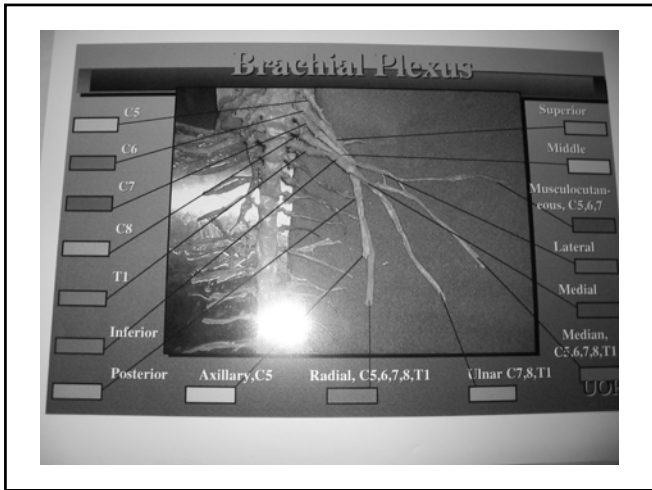
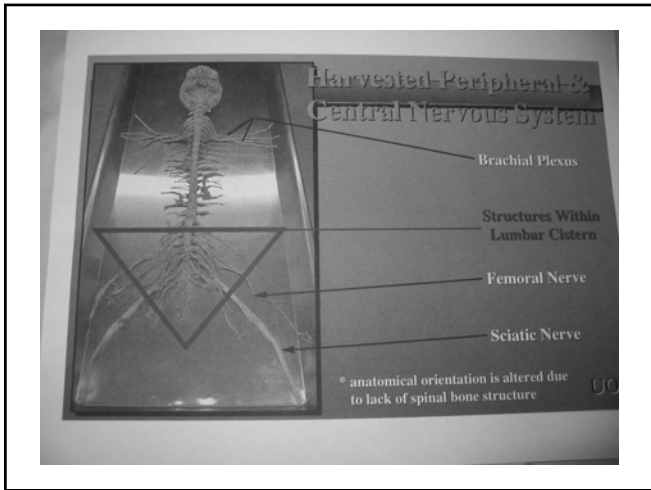
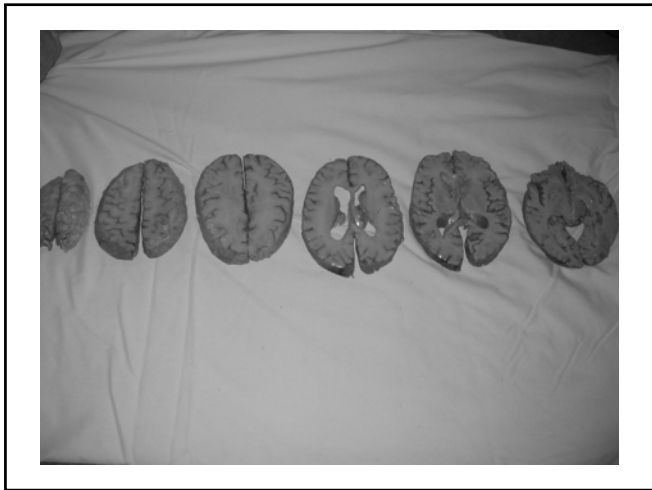
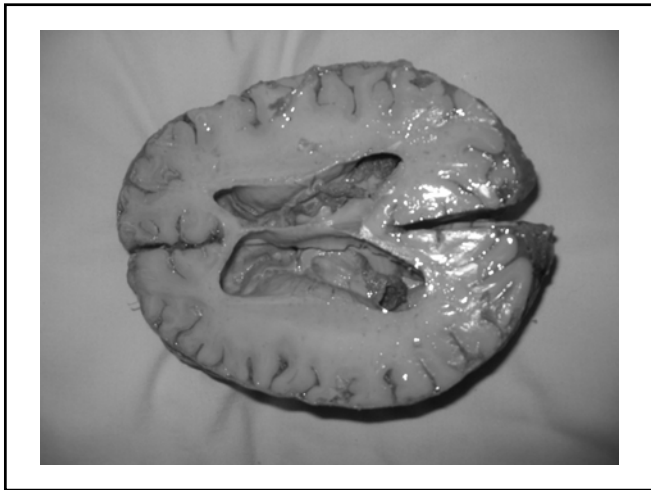
Beyond Plastinating: Advantages

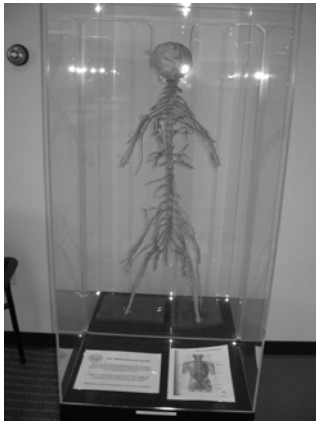
- Save exceptional prosections easily
- Need not duplicate time and energy dissecting each year

Beyond Plastinating: Advantages

- Ease of transport to other locations
 - For presentations
 - For sharing across disciplines with the university
 - For sharing across PT academic programs







Questions?

Thank You!