

**Table 2. Practice Methods for the Fundamental Manipulations of Surgery Through the Ages**

<i>Manipulation</i>	<i>In Antiquity (Sushruta)</i>	<i>1<sup>st</sup> Generation: Modern In Vitro Lab; Part-task Trainers</i>	<i>2<sup>nd</sup> Generation: Computer-based Simulators</i>
<b>Exploration</b>	Probing into worm-eaten wood, or bamboo reed	Exploring, grasping plastic tubes, balls, beans; threading pipe cleaners into tubes; stretching rubber bands over pins, navigation of a camera	Exploring, grasping, retracting, immobilizing virtual 3D anatomic structures, and pathological lesions
<b>Aspiration/ injection</b>	Venisection of dead animals or lotus stems	Aspirating water-filled balloons, bladders; phlebotomy (mannequins), thoracentesis, paracentesis, peri-cardiocentesis	Aspiration of urinary or gall bladders, abscesses, cysts, irrigation fluids, hydro-dissection
<b>Incision</b>	Cuts in cucumbers, melons, gourds	Incision with scissors, into foam, cloth, string, latex, or laser or electro-surgery of animal tissues	Incision sharply with scissors, or laser, electro-surgery, or ultrasound of multiple virtual structures, & various pathological lesions
<b>Evacuation</b>	Of honey from beeswax spread on a plank	No standard method	Removal of blood, clots, stones; contents of cysts, & abscesses
<b>Scarification</b>	On skin with attached hair	Electro-surgery (diathermy), desiccation, vaporization, ultracoagulation; on animal organs or virtual objects	Electro-surgery, desiccation, Vaporization, Ultracoagulation of various anatomic & pathological structures
<b>Extraction</b>	Withdrawing of seeds from fruit, or teeth from dead animals	Removal of seeds from bell peppers	Forced removal of tissues; includes excised & bagged structures and lesions
<b>Excision</b>	Removal of a urinary bladder from a dead animal, or the slimed surface of a leather pouch	Amputation of projections, from foam objects, rubber tubes, virtual tumors (endometrial), enlarged glands (prostate)	Excision of bowel segments, bladders, ovaries, uteri, gall bladders, etc.
<b>Closure</b>	Of cloth, skin, or hide	Haptics-based suturing of foam, cloth, latex sheets, Penrose drains, tubes, or animal organs	Haptics-based suturing or clipping of adjacent, or incised anatomic structures
<b>Implantation/ Transplantation</b>	Not applicable	Placement of central line; chest tube	Placement of central line; chest tube