S565 / S560+ NOELLE™
Maternal and Neonatal
Computer Interactive Simulation System
With Maternal/Neonatal/Fetal Monitors

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All Rights Reserved
The NOELLE simulation system is protected by patents,
including US 6,503,087 and 6,758,676.
PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY PRIOR TO STARTING TRAINING EXERCISES ON YOUR NEW SIMULATOR.

HANDLE YOUR SIMULATOR IN THE SAME MANNER AS YOU WOULD HANDLE YOUR PATIENT – WITH CARE AND CONSIDERATION.

SHOULD YOU HAVE ANY QUESTIONS AFTER READING THIS INSTRUCTION MANUAL, CALL OR E-MAIL OUR CUSTOMER SERVICE DEPARTMENT.

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Section 1 – Rapid Assembly and Check-out
**Introduction** – The NOELLE 565 provides capabilities in ALS, obstetrics, and neonatal resuscitation protocols. It is supplied with virtual maternal and neonatal vital signs monitors as well as a virtual FHR/UA (fetal) monitor. These monitors are driven by a wireless student terminal. The Instructor controls the monitors through a wireless computer. Also included are the operating software for the virtual monitors, the operating system for your computer, technical tips for nine scenarios, and an extensive OB training guide. **Detailed HELP files are found in the Instructor’s Laptop and in Sections 8 and Section 9 of this instruction manual.**

**Contents** – The NOELLE 565 includes the following:

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Description</th>
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<tr>
<td>One</td>
<td>Student terminal with wireless adaptor</td>
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<tr>
<td>Two</td>
<td>17 inch touch screen monitors</td>
</tr>
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<td>One</td>
<td>Software monitoring package, installed on the student terminal</td>
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<td>One</td>
<td>Software control package installed on wireless Instructor terminal</td>
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<td>Instructor wireless laptop terminal</td>
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<td>One</td>
<td>Computer interactive intubatable full body NOELLE with IV arm</td>
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<td>One</td>
<td>Abdomen cover with speaker attached</td>
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<tr>
<td>One</td>
<td>Abdominal cover for palpation/”C” section</td>
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<tr>
<td>One</td>
<td>Automatic birthing system with mounting flange</td>
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<td>Two</td>
<td>Computer Interface Modules (CIM)</td>
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<tr>
<td>Two</td>
<td>Mechanical adaptors</td>
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<tr>
<td>One</td>
<td>Elevating “cushion” for Leopold Maneuvers</td>
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<tr>
<td>Two</td>
<td>Dilating cervices</td>
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<tr>
<td>Two</td>
<td>Placentas; one with detachable fragments</td>
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<tr>
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<td>Vulvas – fully dilated</td>
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<td>Three</td>
<td>Vulva for postpartum repair of episiotomies</td>
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<td>48 hour postpartum uterine assembly</td>
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<tr>
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<td>Kit including lube, Instructions, Training Guide and Teaching Tips</td>
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<tr>
<td>One</td>
<td>Articulating 28 week birthing fetus with patent mouth and nose</td>
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<tr>
<td>One</td>
<td>Computer interactive neonate</td>
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<td>Two</td>
<td>Carrying bags</td>
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One Articulating 28 week birthing fetus with patent mouth and nose
One Computer interactive neonate
Two Carrying bags
Assembly and checkout

NOELLE™ is shipped partially assembled. The preterm fetus and full term neonate are fully assembled.

Place NOELLE on a flat surface. Remove the abdominal cover, remove the fetus, elevating pillow and other materials packed within the abdomen. Note that the automatic birthing mechanism secures the upper and lower torsos using four (4) tee-nuts. Also note that the speaker in the abdominal cover is connected to the birthing mechanism providing the fetal tones. Now connect NOELLE’s legs as outlined below.

NOELLE’s birthing mechanism is secured to the upper and lower torsos with four (4) tee-nuts. Removing these tee-nuts provides a rapid means of disassembly.
To attach the legs, remove the wing nuts, washers and springs from both hips.

Remove IM site from each leg and slide bolt through hole. Reach through the IM site and attach the first washer, then spring, the second washer and finally the wing nut. Tighten nut until the spring is compressed slightly. Replace IM sites.
NOELLE™ 565 SYSTEM

- NOELLE is placed in a birthing bed with student access on all four sides
- Newborn is placed in an infant warmer with access on three sides
- Wireless student terminal and monitors placed between NOELLE and newborn
- CIM boxes are placed near NOELLE and the newborn
- The student terminal wirelessly communicates with the Instructor’s computer that may be located within a control room up to about 30 feet from NOELLE
The Noelle 560 Plus can either be used with the Noelle connected or the Neonate connected, it can not run both manikins at the same time. It is possible that while the software is running the providers can disconnect one CIM box from the serial port and connect the other one to continue their simulation, but it is recommended to close the Noelle 560 Software before switching manikins so that all the initial values from the CIM box are retrieved properly.
Shown below are the elements of the NOELLE birthing simulator

- Add fluid to the IV arm using this blood bag; or attach your own using an IV pole
- Targets on the torsos are conductive sites used with Virtual Instruments®
- CIM box interfaces between the laptop computer and NOELLE
- Blue bulb near IV arm increases fluid pressure; red bulb simulates carotid pulses; blue bulb near knee used to elevate fetus facilitating palpation exercises.
- Red and blue tubes monitor compressions and ventilation; yellow tube provides air pressure for abdominal contractions
- Virtual Instruments® are located in zipper compartment; defibrillators shown
Shown below are elements of the PEDI® Blue full term neonate

- Syringe to arm provides fluid/pressure and drainage for IV exercises
- Syringe to torso provides fluid/pressure and drainage for umbilical exercises
- Syringe to foot provides fluid/pressure and drainage for I/O exercises
- Red bulb simulates pulses at the umbilicus and right arm
- Red and blue tubes monitor chest compressions and airway ventilation
- CIM box interfaces between the neonate and laptop computer
- Virtual Instruments® are in zipper compartment; defibrillators are shown
Instructor’s laptop communicates wirelessly with the tower computer located between the monitor supports. It controls the fetal monitor on the left and the maternal monitor on the right. For example, the maternal monitor now shows classic pregnancy induced hypertension (PIH) and the fetal monitor exhibits a low fetal baseline heartrate with variable decelerations. The student must quickly recognize these dilemmas and call for HELP!

Following delivery the Instructor has selected maternal vitals signs consistent with postpartum hemorrhage (PPH); while neonatal resuscitation has begun on a PEDI Blue neonate. Again, students must recognize these problems and summon HELP stat for both the obstetric and neonatal teams.
Section 2 – NOELLE Patient Care

**Bandaging** - the fingers and toes of NOELLE are separated to permit bandaging exercises. The surface of the simulator is smooth and resistant to water, oil and liniments.

**Eyes/Ophthalmologic Exercises** – The head has separately inset and removable eyes, permitting:

- Administration of orbital medicines, including drops/ointments into the conjunctival sac.
- Removal of foreign bodies
- Eye irrigation

**Teeth and tongue** – Noelle is supplied with fixed upper and lower dentures. The tongue may be moved gently from side to side.

**Hygienic Care** – NOELLE’s head is supplied with a wig for instruction in combing, shampooing and head draping. Bathing exercises may also be practiced.

**Injection Sites** – Sites on the upper left and right arms and legs permit IM injections. An IV training arm provides an extensive venous network to start IVs or infuse fluids.

**Range of Movement** – NOELLE’s head and jaw articulate. The legs and arm articulate in the normal fashion.

**Ear, Nose and Airway** – The ear cavity may be filled with about 10 mL of fluid. The nose is patent permitting feeding exercises or passage of a nasal/tracheal catheter. The airway contains nominal landmarks permitting either BVM or intubation exercises. The trachea extends to the bronchi and lungs. Lungs expand normally permitting realistic chest rise.

**Injection Training Arm and Hand** – IV, IM or subQ exercises can be performed. Always use needle sets sized #22 or thinner to extend the life of the veins and skin. Always use clean water in the veins and drain after use.

**CPR** – Since NOELLE contains a realistic airway we do not recommend mouth to mouth ventilation since the airway would be difficult to clean afterward. Instead use a normal size adult BVM which will seal around the mouth and nose. The ribs have normal anatomic landmarks and the lungs permit an adequate chest rise. NOELLE has three tubes extending from beneath her left arm. One has a squeeze bulb used to pulse the bilateral carotids. Another tube has a blue marking which may be used to monitor airway ventilation. A third tube has a red marking used to measure the depth of cardiac compression. These two tubes may be connected to an optional CPR monitor supplied by Gaumard Scientific. Contact Customer Service for details.
Squeeze bulb is used to generate carotid pulses

**Airway Management** – Most airway management techniques can be practiced on NOELLE including BVM, nasal/oral intubation, and suctioning. For intubation we suggest a Miller 3 or MAC 4 blade as well as a Fr 7 or 7.5 ETT. Use the Sellick maneuver if needed to bring the vocal folds into view. **Remember to lubricate the distal end of any airway device before inserting it into NOELLE.**
Lubricate the distal tip of the ETT prior to intubation
Section 3 - NOELLE™ Obstetric Care

Overview

NOELLE is supplied with a detailed Instructor and Student guide describing what students really need to know as well as quizzes and nine scenarios. Extra copies of the Instructor and/or Student Guides are available from Gaumard Scientific.

Leopold maneuvers using the articulating fetus

To perform Leopold Maneuvers, retract the birthing mechanism fully and remove the articulating birthing baby. Place the elevating cushion within the birthing torso. Route the inflation bulb outside NOELLE through any space provided on the left side. Place the birthing baby in the elevating cushion in the vertex, breech, or transverse positions. Install the “tummy cover”. Inflate the elevating cushion until the fetus is felt within the abdomen.
Place elevating pillow within simulator

Place fetus onto elevating pillow and lift fetus anteriorly using squeeze bulb.
Snap abdominal cover into place.

Lift fetus anteriorly using squeeze bulb.
Conduct the four Leopold Maneuvers.

Normal Labor and Delivery

To conduct a delivery, remove the “tummy cover” and place the articulating birthing baby on the birthing mechanism. **Lubricate the fetal head and shoulders, plus the inside of the vulva using water based silicone.** Attach the umbilical cord to the baby, route the cord so it does not bind in the mechanism and attach the placenta to the pelvic cavity using the Velcro® fastener. Note that the fetus has a receptacle at the rectum into which the matching pin located on the birthing mechanism is inserted.

Position the baby so that its head faces toward the left side of the simulator. This is the ROA or **right occipital anterior** position. Note: any other position may be chosen; however, take care that the fetal shoulders are aligned with the long axis of the vulval insert. **Caution: if the fetal shoulders are NOT aligned with the vulva, binding may occur.**
Remember to lubricate the inside of the vulva

Also lubricate the inside of the dilating cervix.
Now thoroughly lubricate the fetal head and shoulders.

Attach the umbilicus to the placenta.
Attach placenta to one of three positions on the abdominal wall. Orienting the Velcro patches in parallel causes the placenta to be retained; orienting them at right angles causes the placenta to release with modest traction.

Attach umbilicus to fetus.
Position the fetal arms and legs as shown

Umbilical cord can be wrapped once around the fetal neck
Attach fetus to birthing mechanism using one or two birthing adapters

The first few centimeters of movement normally take about half the total delivery time. Note that the baby rotates internally as it moves forward and that the baby turns after the head is delivered and before the shoulders are delivered. *The student or instructor may help the fetal head and shoulders through the vulva as in real life.* Once the shoulders are delivered, the student can remove the baby from the mother in the normal manner.

The birthing cycle can be paused at any point and then resumed. The sound produced by the small motor is an excellent indicator whether the fetal movement is being slowed by undue friction. In the event the birthing baby binds in the birth canal, the mechanism will pause and back up. It will automatically try a second time. If this occurs, remove the abdominal cover and determine the cause. **In most cases, binding can be prevented by thoroughly lubricating the fetus, the dilating cervix and the vulva.**

During delivery, fetal heart tones can be heard by placing the bell of a conventional stethoscope on the abdomen. Move it around until the tones are clearly heard. Tones are supplied via a small speaker which can be located in three areas depending upon the fetal lie. The amplitude of the fetal heart tones is set at Gaumard. To adjust the amplitude, look for a small hole on the bottom of the Birthing Controller. Insert a small screwdriver, engage the adjusting screw and turn clockwise or counter clockwise.
Cervix dilates as fetal head moves down birth canal

Fetal head at crowning
Mouth and nose suctioning can be simulated.

External fetal rotation aligns shoulders with the longitudinal axis of the vulva.
Vacuum-assisted Delivery

Vacuum-assisted delivery is a technique for the management of arrest during the second stage of labor. Criteria for successful delivery include: (1) cervical dilation is complete; (2) cephalic presentation is confirmed; (3) the fetal head is no more than 1/5 palpable above the pubic bone; (4) effective uterine contractions continue; (5) maternal expulsive efforts continue.

Vacuum-assisted delivery may be practiced with the NOELLE simulator using a vacuum cup supplied by a number of suppliers.
Lubricate the fetus supplied with NOELLE and place it onto the delivery system in the normal ROA position. **Note: NOELLE models supplied since Jan 2005 include a soft scalp you may place over the skull providing a better vacuum seal between the fetal head and the vacuum cup.** Activate the delivery mechanism and the fetus will move down the birth canal. Select “Pause” as soon as the cervix is fully dilated. This is before crowning and “pausing” will stop the delivery mechanism. Insert a lubricated vacuum cup into the vagina and place the cup onto the flexion point of the skull located between the fontanelles. Use the manual vacuum pump supplied with such devices to cause the attachment of the cup to the skull. Wait a few minutes for the “chignon” to form.

![Vacuum assist device attached to fetal scalp between fontanelles](image)

Await the next contraction that may be simulated by asking NOELLE to bear down, and having the student apply steady traction perpendicular to the plane of the cup. Select the “Resume” key, then the “Pause” key again to move the fetus slightly down the birth canal. Some vacuum-assisted delivery devices are equipped with a means for measuring the amount of traction which may be on the order of about 15 pounds. The student must stop traction when the simulated contraction ceases. Repeat this procedure of waiting for the simulated contraction and providing traction during the contraction if and only if the fetus is moving down the birth canal with each contraction. The student may also assess the potential need for an episiotomy to facilitate delivery. **In the event delivery progress is not being made, NOELLE must be immediately referred as a potential “C” section candidate.**
Shoulder Dystocia

Shoulder dystocia is a dangerous condition defined in the NOELLE Guide as the “arrest of delivery of the fetal body after the successful delivery of the fetal head”. It may be characterized by the so-called “turtle-sign” wherein the fetal head moves forward and then retracts. During dystocia, the fetal shoulders become wedged behind the symphysis. NOELLE may be used to practice the resolution of dystocia using episiotomy techniques, the McRobert’s maneuver, suprapubic pressure, posterior arm sweep or elbow-knee delivery.

The McRoberts maneuver causes pelvic tilt that may release the fetal shoulder from behind the pubic bone

Suprapubic pressure may also release the fetal shoulder
To demonstrate shoulder dystocia, place the fetal baby in the ROA position. Locate a small squeeze bulb at the lower left side of NOELLE and note it is attached to an inflatable bag near the dilating cervix. Inflate the bag using the manual squeeze bulb noting that the fetal head and shoulders will rise toward the symphysis. Note that the fetal head/shoulders are palpable beneath the stomach cover. Activate the delivery mechanism moving the fetus down the birth canal until the fetal head is delivered. Simulate dystocia by clicking the “On” on the Dystocia section on the ‘Labor tab’. Once the dystocia mode is active the fetal traces will automatically set to real time mode and with each contraction there will be a “Turtle Sign”.

Students must use the various maneuvers attempting to deliver the baby. Once the students do all the appropriate maneuvers required by the instructor, the dystocia mode can be deactivated by clicking on the “Off” button. Once the dystocia mode is off, the fetal traces and labor warp factor will adjust to the previous settings, and the labor will continue allowing the baby to come out.

Note: It is very important that the students are aware of the “Turtle Signs”. If by any chance the students do not take proper action the labor can be stopped completely and the instructor can add to the log an unsatisfactory note of the student’s actions.

Manual squeeze bulb expands inflatable bag beneath fetus lifting it anteriorly. This facilitates palpation as well as exercises such as suprapubic pressure.

Note: do not place the fetus onto the delivery mechanism in the LOA position it will attempt to birth with its shoulders at right angles to the axis of the vulva causing undo stress on the delivery mechanism. At any time the Instructor may completely retract the
delivery mechanism by toggling the power switch first to the “off” position and then to the “on” position.

Cesarean Delivery

Cesarean birth is the delivery of the fetus through an abdominal and uterine incision. A Cesarean delivery, also called a C-section may be performed as a result of breech presentation, pre-term or dysfunctional labor, fetal distress, prolapsed umbilical cord, placenta previa, abruption placenta, or a variety of other abnormalities. Demonstrate a C-section using NOELLE by removing the metal snaps just above the pubic bone and birthing the baby between the stomach cover and the pubic bone. An optional abdominal cover is available if the Instructor wishes to demonstrate midline or “bikini” incisions.
Prolapse of the Umbilical Cord

Prolapse of the umbilical cord is a dangerous complication which involves the presence of the umbilical cord in the birth canal in front of the presenting part. This condition may occur as a result of breech presentation, transverse lies, a small fetus, an overly long cord, a placenta placed low in the uterus, or other abnormalities.

If the cord is observed in the birth canal ahead of the presenting part, gloved fingers should be inserted and the presenting part lifted off the cord to relieve pressure on the cord. This procedure must be maintained until the prolapse has been solved, either by a termination to the compression of the cord, or until delivery of the fetus by C-section.

Placenta Previa

Placenta previa is a condition in which the placenta is located in the lower half of the uterus, located near or covering the cervical os. There are three types of placenta previa: total, partial and marginal. Total placenta previa is when the placenta completely covers the cervical os. Partial placenta previa is when the cervical os is partially covered by the placenta. Marginal placenta previa is when the edge of the placenta extends to the internal os, where the uterus opens into the vaginal canal.

To simulate placenta previa with NOELLE, place the placenta in the desired position to simulate the condition, with the maternal side against the uterine wall or the cervical os. Then place the fetus within the uterine cavity with the presenting part closest to the placenta.
Total placenta previa in which the placenta completely covers the well effaced cervical os

External Version

Version may be attempted to rotate the fetus from a breech position into one permitting normal vertex presentation. To practice “version” remove the abdominal cover and the fetus, retract the delivery mechanism fully and insert the inflatable cushion. Next, remove the foam in the abdominal cover. Thoroughly lubricate the inside surface of the abdominal cover, the fetus, and the inflatable cushion.

Place the lubricated fetus onto the lubricated inflatable cushion and snap the lubricated abdominal cover into place. Inflate the cushion lifting the fetus anteriorly. Inflate the cushion at the base of the pelvic cavity to position fetus.
Confirm the breech position and attempt to manually turn the fetus within the uterus by transabdominal manipulation

Breech Birth

Breech birth occurs when either the buttocks or lower extremities of the fetus are the presenting part. There are three types of breech birth: frank, complete and incomplete or footling. Frank breech occurs when the buttocks are the presenting part and the legs of the fetus are extended up toward the baby’s head. Complete breech occurs when the buttocks are the presenting part and the baby’s legs are flexed along the lower torso. Footling or incomplete breech occurs when one of both of the legs are the presenting part.

There are many differences in labor between the breech presentation and the vertex presentation. With the descent, the posterior hip encounters the pelvic floor and internal rotation takes place, allowing the anterior hip to move beneath the pubic arch. The anterior hip then delivers, followed by the posterior hip, the legs and the feet. External rotation allows the shoulders to move into the maternal pelvic and internal rotation allows the shoulders to deliver. Downward traction allows the delivery of the anterior shoulder, with a finger inserted into the birth canal to free the arm. Upward traction allows the posterior shoulder to deliver and the posterior arm is freed in the same manner. After the delivery of the shoulders, the fetal head delivers in a flexed or heads up position.

Although it is possible for a vaginal delivery of breech presentations, once a breech presentation has been confirmed, a Cesarean is often performed to lower the risk of infant mortality due to cord prolapse or birth asphyxia.
To simulate breech presentations with the NOELLE, retract the birthing mechanism fully, remove the cover in the fetal head, insert the birthing mechanism into the fetal head using either one or two adapters and place the fetal legs in either an extended position to simulate “footling” delivery or retract the legs for a “frank” delivery.

Remove plug in fetal head for breech delivery

Removing plug reveals aperture for birthing mechanism
One way of not losing the plug is to insert it into the rectum. Also remember to lubricate the lower torso and legs of the fetus.

Attach the fetal head to the birthing mechanism using one or two adapters.
Assisting a frank delivery

The Pinard or leg-flip maneuver frees one leg then another. The fetal arms may also require a similar maneuver during delivery.
The fetal arms are delivered and the fetus rotated anteriorly to birth the head.

**Delivery of the Placenta**

The placenta supplied with NOELLE may be positioned so that it births spontaneously or requires either modest cord traction or manual removal. In addition, note that the placenta is designed with two removable placental fragments. These fragments are attached to the body of the placenta with Velcro. You may reverse one or both fragments causing one or both to birth with the placenta or remain affixed to the uterine wall.

Students must carefully inspect the birthed placenta to make sure it is complete and that no fragments remain internally. If retained fragments are noted the student must retrieve them using a gloved hand under appropriate sterile conditions.
Postpartum Activity

Fundal Massage

After delivery the uterus normally contracts reducing postpartum bleeding. Under certain conditions contraction does not occur and extensive bleeding may continue. If this condition is not recognized and treated in a timely manner the new mother may go into shock and die. Inadequate uterine contraction may present as a “boggy” or soft uterus assessed through abdominal palpation. Uterine contraction may be augmented using certain drugs and/or uterine massage.

To simulate pharmacologic intervention, access NOELLE’s bilateral injection sites. To practice uterine massage, remove NOELLE’s fully dilated vulval insert and snap the postpartum perineal insert into place. Attach the large postpartum uterine assembly to the distal end of the vagina using the locking ring assembly. Note that the postpartum uterine assembly consists of a thin outer uterine skin and a smaller, harder inner uterus.

Use the squeeze bulb attached to the postpartum uterine assembly to inflate the space between the two uteri expanding the soft external skin sufficient to simulate a “boggy” uterine condition. Bimanual massage will cause air to leak from the thumb screw in the squeeze bulb causing the outer skin to contract. When sufficient air is released the student will begin to feel the harder inner uterus which simulates the well contracted postpartum state.

Remove the vulva and cervix, and insert the uterine assembly
Retract the delivery mechanism, place the elevating cushion, and insert the uterine assembly from the side shown.

Snap the uterine assembly into place and use the squeeze bulb to produce the uterine tone desired. Lift the uterus anteriorly using the elevating pillow. The white Velcro patch on the fundus may be used to position the uterus at various orientations within the abdominal cavity.
NOTE: Starting on August 2008 the new models are coming out with a new postpartum uterine assembly that allows the user to connect fluids for a post partum hemorrhage scenario. It is strongly recommended to use water to simulate the fluids; this will avoid any stains on the manikin.

Snap the uterine assembly into place and use the squeeze bulb to produce the uterine tone desired. Then connect the hoses coming from the uterus and the birth canal to either the syringe or the ‘Blood Dispensing Bag’. Make sure to select if the fluids are going to come from the inside of the uterus, the walls of the birth canal or both.
Use bimanual massage to shrink the “boggy” uterus into a smaller and firm condition.

**Episotomy Repair**

Remove the fully dilated vulva used during delivery and select one of the three episotomy repair modules. Snap a repair module into place. Use a “000” size suture and small curved needle to repair the surgical incision or repair.

*Episotomy repair modules snap into birth canal*
“000” sized sutures are recommended to extend the life of the repair modules.
Section 4 - NOELLE™ Neonatal Care

The full size neonate supplied with the NOELLE S555 is a resuscitation baby having a patent umbilicus and the ability to change color with airway ventilation:

- Realistic airway with tongue, vocal folds, trachea, and esophagus
- Articulating head, neck, jaw, arms and legs
- Heart, lungs, ribs, stomach and liver
- Perform BVM or CPR
- Conduct oral or nasal intubation plus suctioning
- Crico prominence permits the Sellick maneuver
- Bilateral lung expansion with realistic chest rise
- Patent umbilicus

**Airway Management** – Be sure to treat the simulator as you would treat a real newborn with care and consideration. Before inserting ET, NP, or OP tubes always **lubricate** the distal end of the tube. Failure to do so will damage the tiny airway. **When intubating we suggest a Miller 1 blade and an uncuffed 2.5 mm ETT with appropriate stylet.**

Practice BVM techniques using an “infant” sized mask having a thick seal
Intubate using a Miller 1 blade and well lubricated 2.5 ETT with stiffening stylet.

Color Change

The neonate has devices in its forearms and lower legs to cause the skin to turn from a normal healthy color to a blue color indicative of peripheral cyanosis. It also has devices in the cheeks which cause the skin to turn from a normal color to an ominous blue color indicative of central cyanosis. These devices are controlled by a monitor that starts the neonatal simulator in one of three selectable states: central, peripheral, or healthy. The monitor observes ventilations and compressions performed on the neonate and determines whether they meet or exceed conventional standards. If acceptable, the monitor causes the skin to turn to a more healthy color; if inadequate or non-existent, the monitor causes the skin to turn toward an ominous blue color.

The rate of improvement and deterioration is selectable and is defined as the time between each of the three selectable states. The monitor also has a “coach” and “test” mode. In “coach” the student will hear sounds indicating that it is the correct time for ventilations and compressions. In “test” the sounds are silenced. The monitor also features a visual display to see whether the rescue efforts are judged as being too high, too low, or just right.
To get started attach the red chest compression and blue airway ventilation tubes to the monitor. Attach both the cable from the neonate and the power supply to the monitor. Switch the monitor on and observe the color of the neonate. Perform BVM or CPR in the normal manner. The condition of the neonate will progressively worsen if appropriate treatment is not received.

**Umbilicus**

The umbilicus remains patent for several hours after birth and may be used to infuse medications in a critically ill neonate. The neonate supplied with NOELLE has a patent umbilicus for use in such training.

The umbilicus is connected to an internal reservoir that can be filled with fluid using the syringe provided. Students can insert a lubricated standard umbilical catheter, verify catheter placement by removal of fluid, and add medications as needed for the training exercise. Both the filling and drainage tube are located on the right side of the neonate.
Section 5 - NOELLE Care and Maintenance

Lubricate distal tip before inserting umbilical catheter

Treat NOELLE, the birthing fetus, and full term neonate with care, as you would in a delivery environment.

After use, clean the simulators with a mild detergent or with soap and water. Remove all traces of any lubricant. Do not clean with harsh abrasives. Dry thoroughly.

* Store the simulators in a cool area in the packing carton provided.
* Do not stack or store heavy materials on top of the carton.
* Indelible marks made with ballpoint pens, ink or marker cannot be removed.
* Do not wrap the simulator in newsprint.
* Do not use povidone iodine on the simulator.
* Replacement parts are available from Gaumard Scientific or from your Distributor.
Section 6 – Limited Warranty

Gaumard® Scientific Company (Gaumard) warrants that if the accompanying product proves to be defective in material or workmanship within one (1) year from the date of the original purchase, Gaumard will, at Gaumard’s option, either repair or replace same without charge. This limited warranty may be enforced only by the first consumer user. All subsequent purchasers acquire the product “as is” without this limited warranty.

This warranty covers all defects in material or workmanship, except:

1. Damage resulting from accident, misuse, neglect, or from other than normal and ordinary use of the product.
2. Damage resulting from failure to clean or use the product in accordance with the instructions.
3. Damage resulting from repair or attempted repair by anyone other than Gaumard.

When repair is indicated, the user must:

1. Contact Gaumard and request service authorization.
2. At the customer’s expense, ship the product with a copy of the bill of sale to Gaumard.

Gaumard disclaims liability for incidental and consequential damages for breach of any express or implied warranty, including any implied warranty of merchantability with respect to this product. This writing constitutes the entire agreement of the parties with respect to the subject matter hereof, no waiver or amendment shall be valid unless in writing signed by Gaumard.
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<tr>
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<td>In-Service Education for S560</td>
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<tr>
<td>560.001</td>
<td>Face assembly</td>
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<tr>
<td>560.002</td>
<td>Torso cover</td>
</tr>
<tr>
<td>560.003</td>
<td>Left arm assembly</td>
</tr>
<tr>
<td>560.004A</td>
<td>Right IV arm assembly</td>
</tr>
<tr>
<td>560.005</td>
<td>Lower torso and two legs</td>
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<td>560.007</td>
<td>IV Arm sensor &amp; cable assembly</td>
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<td>560.008</td>
<td>Stomach cover</td>
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<td>560.009</td>
<td>Speaker for Noelle</td>
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<td>560.011</td>
<td>CIM Box</td>
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<td>560.012</td>
<td>Power Supply 100/240VAC; 4 AMP</td>
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<td>Automatic Birthing Mechanism</td>
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<td>Fetal HR belt &amp; cable assembly</td>
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<td>Stomach cover w/speaker and in</td>
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<td>560.016</td>
<td>Articulating ultrasound wand</td>
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<td>Articulating birthing baby</td>
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<td>BP/OSAT/HR cable set</td>
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<td>Temporary external pacer</td>
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<td>AED cable set</td>
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<td>Waist rod and thumb nuts</td>
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<td>#27 eyes (set of 2)</td>
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<td>560.027</td>
<td>Dentures</td>
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<td>Stomach Cover, Softer</td>
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<td>560.03</td>
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<td>560.030/1</td>
<td>Boggy Uterus w. blood capability</td>
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<td>560.031</td>
<td>48 Hour Uterine Postpartum Act</td>
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<td>560.032</td>
<td>Episiotomy trainer, set of 3</td>
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<td>560.033</td>
<td>S560 Pedi Blue (umbilical pulse)</td>
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<td>560.034</td>
<td>Dilating cervices, set of 2</td>
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<td>560.035</td>
<td>Vulval Insert (set of 2)</td>
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<td>Articulating Birthing Fetus</td>
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<td>Placenta for S560</td>
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<td>560.039</td>
<td>Set of 5 umbilical cords</td>
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560.040 Veins (set of 9)
560.041 Blood bag
560.042 Blood concentrate
560.043 Skin
560.044 Base
560.045 Base with blood bag
560.046 Squeeze bulb, tubing
560.05 Motor for S560
560.051 Breech Fetus
560.052 Noelle CDROM software
560.053 Difficult Deliveries Product D
560.059 Noelle Carrying bag
560.060 Shoulder Dystocia Bladder
560.066 Baby Umbilical Replacent Cords (Set of
560.085 Spare balloon assembly for tummy
560.086 Silicone Lubricant
560.087 Neck Brace for Noelle
560.111 Instruction Manual
560EXW Cost of 2 year Extended Warranty
CAF-S560 Repair/Replacement
CD560 Noelle Product Demo
RA-S560 Repair/Replacement
S560 Interactive NOELLE Mat & Neonate
S560 EXW S560 Extended Warranty
S560.004 Shoulder Dystocia Bag
S560.012 Laptop Computer w. S560 software
S560.028 Wig
S560.029 Abdominal Cover for C-Section
S560.036 Articulating Birthing Baby
S560.063 Simulator Interface Cable for
S560.084 I/O Bone Cover and Skin
S560.1 Stomach Cover and Software 2.1
S560.100 InService Education for S560
S560.2 Motor & CIM box
S560.200 Noelle Upgrade
S560.201 Upgrade NOELLE S560 to S560+
S560.300 NOELLE Upgrade: S560 to S565
S560.400 MONITOR FOR S560
S560.500 LAPTOP CARRYING CASE
S560.MISC Repaired post-partum kit
## NOELLE S565

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<tr>
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<td>Shoulder Dystocia Bladder</td>
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<td>Stomach Cover</td>
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<td>Balloon Assembly for Contractility</td>
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<td>Power Cord</td>
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<td>Placenta with velcro retainers</td>
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<td>Boggy uterusw. tubes and pump.</td>
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<td>48 Hour Postpartum uterine assembly</td>
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<td>Articulating baby</td>
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<td>Pedi Blue for S565</td>
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<td>565.086</td>
<td>Silicone Lubricant</td>
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<td>NOELLE Maternal and Neonatal</td>
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<td>A/C powered monitor with 17'</td>
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<td>Power Supply 100/240VAC; 4 Amp</td>
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<td>S565.013</td>
<td>Birthing Mechanism</td>
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<td>S565.016</td>
<td>Dilating Cervices</td>
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<tr>
<td>S565.017</td>
<td>Replaceable Vulva Inserts</td>
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<td>S565.019</td>
<td>Placenta with Velcro Retainers</td>
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<td>S565.020</td>
<td>Umbilical Cord and Clamps</td>
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<td>S565.029</td>
<td>Abdominal Cover for C-Section</td>
</tr>
<tr>
<td>S565.030</td>
<td>Postpartum Perineal Insert</td>
</tr>
</tbody>
</table>
S565.032  Episiotomy Trainer (set of 3)
S565.034  C-Section Belly Cover
S565.035  USB Plug-in adapter
S565.050  Elastomeric Cervices w. lube
S565.060  S565 Storage Cases
S565.100  Neonate without CIM Box
S565.201  Monitor Software
S565.203  Touch Screen Monitor
S565.EXW5  4 Year Extended Warranty
S565EXW  Cost of 2-year Extended Warran
S565-EXW  Cost of 2-year Extended Warran
S565EXW4  2 Year Warranty

**NOELLE Instructions**

B500  Instructor Guide
B500.1  Student Guide
  Teaching Tips

Contact [Gaumard Scientific](https://www.gaumard.com) for pricing.

Section 8 - SETTING UP NOELLE™ 565 IN YOUR FACILITY

SETTING UP YOUR NOELLE™ 565 SYSTEM
- Do not connect any cables, other than the power supply, to the Laptop

- Position the two touch sensitive monitors close the desktop computer
- Connect both monitors and the computer (student terminal) to a power outlet (100/240 VAC 50/60 Hz)

- Before turning on the student terminal connect the main and secondary monitors to the back of the student terminal as shown:
- Each monitor is supplied with a USB connector that must be connected as shown:

- Each monitor has an audio jack that must be connected as shown:
  - Green Port → Main Monitor
  - Black Port → Secondary Monitor
- Connect the wireless antenna supplied with the NOELLE 565 as shown:

- Connect the serial cables coming from the Noelle SIM box and the Neonate SIM box to the Serial ports on the back of the desktop.
  NOTE: The software will only run the boxes if they are connected to the desktop, they will NOT run if connected to the port on the laptop.
The serial cables can be connected on either port; the software will detect automatically which one is Noelle or the Neonate.

- Connect the Mouse and Keyboard as shown:

(Mouse)      (Keyboard)

**Connection Summary**

Place the Touch Screen monitors close enough for all the cables to reach the desktop. Connect the cables to the back of your desktop. Please check on the picture which desktop looks like yours.
Fig 1. Desktop Cable configuration 1.

Fig 2. Desktop Cable configuration 2.

Note: If serial card is not built in.
Connect the required monitor cables to the desktop (video, audio and USB) and the power cable to the AC outlet.

**NOTE:** Make sure both monitors are 'On' before you turn on the desktop.

**You are now ready to turn on the computer (student terminal)!**
Gaumard User Interface Software

NOELLE 565 can be used as a general teaching aid or in conjunction with the labor and delivery scenarios provided in the NOELLE Training Guide. It allows you to generate realistic electronic fetal monitor (EFM) traces and display simulated maternal and neonatal vital signs. Review the enclosed Software License Agreement before proceeding.

NOELLE 565 run on two software packages using two computers connected by a network, either through cabled or wireless Ethernet link.

This software allows the instructor to communicate with the Maternal/Neonatal/Fetal Monitors in order to simulate a wide range of scenarios. At the same time it allows the user to communicate directly with the Noelle and Pedi Blue Baby. The user has 9 preconfigured Scenarios explained in the NOELLE Training Guide. It also allows the user to create new cases and save them for future use. The user can also change any parameter from the Maternal Vitals, Neonatal Vitals or Fetal Monitor while a scenario is under way.

GaumardUI – NOELLE

NOTE: For a more detailed explanation of the software you can open the Help file located on the “Help” menu one you run the GaumardUI software.

When starting the GaumardUI software, one must first select a Profile.

To access the Profiles window at any time, select Profiles from the File pull-down menu. Profiles are used to organize and protect software settings. As you begin to customize NOELLE, it will become clear how profiles can best serve your needs. For example:

* It may be appropriate to assign one profile to each user of your NOELLE system.
* Others may choose to create a profile dedicated to a specific academic course, which might be taught by multiple instructors.
* For the most detailed exercises, it is sometimes useful to devote an entire profile to one particular subject area, or even one particular scenario.

When starting out with GaumardUI, it is recommended that you use the Quick Start Scenarios profile, which was created in
conjunction with experienced healthcare instructors and working medical professionals. Quick Start Scenarios instantly turn you into a simulation expert. See the Factory Preset Profiles appendix for detailed description of the Quick Start Scenarios profile.

One can also choose the Default profile, which has a generally applicable Palette that is useful for simulating common medical emergencies. For many applications, the Default profile is a convenient starting point that can be customized to fit your particular simulation objectives.

Notice that there are a number of options when creating a new profile. You may choose to include the contents of the "Default" or "Quick Start Scenarios" profiles or to copy the contents of an existing profile. For security, you can enable PIN protection, which will require the user to enter a 4-digit key before loading that profile. For more detail on manually manipulating profiles with Windows Explorer, advanced users should refer to the File Structure appendix at the end of this guide.

The Status Panel

At all times, the Status panel will be visible along the left edge of the NOELLEUI window. The vital signs and other details of the simulated patient are shown here. Most important are the battery and communication indicators at the top of the Status panel, which are discussed below.

* Airway

The Airway section displays the state of the difficult airway actuators and the sound being played at the throat. A bark blue bulb means that the actuator is off, and a light blue bulb indicates that it is active.

* Breathing

The Breathing section shows detailed information related to respiration. Note that O2-saturation is in parentheses, because it is only a 'virtual' vital sign that cannot be evaluated on the manikin. This information serves as a reference for the facilitator.

* Circulation

The Circulation section displays Noelle's cardiac parameters.

* UA

The Uterine Activity section displays the current state of Noelle's contractions.

* FHR

The Fetal Heart Rate sections displays all the current states of the fetal trace.

DETAILS
It is best to think of controlling the Noelle simulator in terms of three levels of complexity: firstly Details, then the Palette, and finally Scenarios. The Details page is the first of the tab-pages found in the main area of the GaumardUI window. This is the most simple form of control available to the facilitator. Note that, for each item in the Status panel, there is a corresponding field or control on the Details page.
Simply choose the settings you wish to change from the available fields and click one of the Apply buttons below. New settings will be applied over the time period indicated by the button's label. Click the NOW button to change NOELLE's condition instantly, or click one of the other Apply buttons to create a trend.

Some settings always get applied immediately, such as cardiac rhythm and breathing pattern, while numerical settings, such as heart rate and respiratory rate, can be easily made to transition gradually (linearly) from their current values to any target you specify. The right-most button can be customized to any transition time you require by clicking the part of the button labeled Edit.

As transitions are applied, the time remaining in the transition is displayed in the Clocks panel at the bottom of the GaumardUI window.

It is very important to note that those settings that you do not specify will remain unchanged.

If there is already an ongoing transition at the moment you click an Apply button, it will stop, and a new transition will begin from the current physiological state.

The Details page is also used to create Palette Items. A Palette Item is any full or partial set of physiological parameters that have been grouped and saved together under a single name. To create a Palette Item, choose the desired parameters on the Details page and click the Save as Palette Item button near the top of the page. You will be prompted to name and describe the item and to assign it one of four color-codings for easier identification.

The collection of all Palette Items in this profile are displayed on the Palette page, the next topic of this guide.

**PALETTE**

The second level of control is the Palette tab-page. Each item on the Palette represents a complete or partial physiological state. The Palette page displays all of the Palette Items in the active profile. Each profile has its own separately customizable Palette. Create Palette Items with the Details page, as described previously.
Apply Palette Items using the buttons at the bottom of the page, exactly as changes to NOELLE's condition are applied on the Details page. Change NOELLE's vital signs and symptoms instantly by clicking to select a Palette Item and clicking the NOW button. Or, create a gradual transition in physiological state with one of the other Apply buttons.

Palette Items can be sorted with the View buttons found on the right side of the page.

Editing existing Palette Items is simply a matter of selecting the item you wish to modify and clicking the Edit button. You will be automatically be taken to the Details page, and the settings that comprise the selected Palette Item will be displayed. Change them as desired, and click the Save as Palette Item button.

Many of the functions related to Palette Items are also available by clicking the second mouse button (usually the right button) while the pointer is positioned over an Item. Note, when using the tablet computer, this is best done by holding the stylus button while tapping the screen.

For more information on customizing the Palette, see the Tips on Palette Item and Scenario Creation section of the appendix at the end of this guide.

**SCENARIO**

The most advanced method of controlling the NOELLE system is to build a Scenario, a sequence of Palette Items and delay periods. This is done on the third tab-page in the main area of the NOELLEUI window. The best way to think of a scenario is like a "play list" of palette items. Consistent with this analogy, scenario controls at the bottom of the page look and behave just like traditional and software-based media players.
Scenarios let the facilitator automate most of the changes to NOELLE's condition, so that their attention can remain on the providers' actions. The scenario system can also provide standardization of the patient's presentation of symptoms. For fair assessment of providers and any research application, such standardization is key.

Building Scenarios

Building a scenario is very simple. Simply click the Add to Scenario... button on the right side of the page. You will be presented with a list of all the Palette Items in the active Profile and a field for setting the transition time. When running a scenario, this transition time functions just as the time on the Apply buttons on the Details and Palette pages.

From the Add Item window, you may also choose the "Wait" item, which causes a delay of a specified duration, or a "Wait Indefinitely" item, which causes the scenario to pause at that point until the facilitator manually advances to the next item.
One can manipulate the scenario items with the Selected Item group of buttons on the right side of the page. Most of these functions are also available by right-clicking on scenario items. (When using the stylus, hold the stylus button and tap the screen to do a "right-click.")

**Scenario Control**

Scenarios are controlled from the buttons at the bottom of the Scenario page. The same way a music player plays songs, the Scenario plays palette items. Intuitively, the facilitator can play, stop, pause, skip, or repeat items as appropriate. The Scenario Position Indicator points to the current item and shows the current status of the scenario. The following paragraphs describe in detail the behavior of each button and indicator.

- **The Scenario Buttons**

  ![Play](image)

  Play is one of the states of what will be called the Control button. When clicked, the scenario will play the item to which the scenario position indicator is pointing.

  ![Pause](image)

  Pause is the other state of the Control button. It is only active when the scenario is playing and pauses it on the current state. It is disabled when a 'Wait indefinitely' item is playing since, functionally speaking, the scenario is already paused.

  ![Stop](image)

  The Stop button has 2 behaviors depending on when it is clicked. When clicked once, the Stop button halts the scenario at the end of the currently playing item. When clicked a second time, the scenario is stopped immediately. For example, if the currently playing item has a transition of 1:00 minute and the Stop button is pressed when it has 0:10 seconds left, the scenario will be halted at the end the transition (i.e. in 10 seconds). If the Stop button is clicked again within those remaining 10 seconds, the scenario stops immediately.

  ![Next](image)

  The Next button advanced the indicator to the next item on the scenario regardless if the scenario is playing, paused, or stopped. It can also be used to move the indicator to select an item before playing it.

  ![Previous](image)

  Similar to the Next button, the Previous button returns the indicator to the previous item in the scenario.

  ![Reset](image)

  The Reset button stops the scenario immediately and returns the indicator to the first item in the scenario.

- **The Scenario Position Indicator**

  ![Unfilled Triangle](image)

  An unfilled triangle means that the scenario is stopped. When the Play button is clicked, the item that the indicator is pointing to will be played.

  ![Rapidly Blinking Triangle](image)

  A rapidly blinking triangle means that the scenario is playing the item to which the indicator is pointing.
A slowly blinking triangle means that the scenario is paused at the item to which the indicator is pointing.

For more information on building your own scenarios, see the Tips on Palette Item and Scenario Creation section of the appendix at the end of this guide.

**LABOR**

The most advanced method of controlling the NOELLE birthing system is to build a Labor Scenario, a sequence of Palette Items with delay periods corresponding to a labor curve. This is done on the fourth tab-page in the main area of the GaumardUI window.

**Save Scenario**

There are a couple of things that have to be done before a scenario is saved. First it is important to set the 'Descent' curve as desired, then add the 'Palette' items that correspond to this scenario on the time line. Then click on the 'Save Labor' button, which will open a window where the user can input some feedback about the scenario for future reference. The only thing that is required on this window is the 'Mother's Name' which will be the folder with all the scenario details, all the other information is optional.

**Load Scenario**

To load a labor scenario click in the 'Load Labor' button on the Labor tab, the Load screen will open. All the previously saved files will appear on the left hand side text box, by doing a single click over a name the patient information will appear. To see the details for each stage select each tab individually.

**Time Information**

- Labor duration: Time of the delivery from stage one to stage three.
- Wart Factor: By increasing this number the labor duration will be shortened so that the labor can be simulated faster. An approximation of the 'Labor duration' will be given in parenthesis.
Labor Time: This timer represents the time on the labor curve.

Labor Control

- Pause: While this button is activated the labor will be paused.
- Run: While this button is activated the labor scenario will run.
- Reset: This button will reset the motor to the initial position and it will also reset the labor scenario to its initial conditions.

Dystocia

The dystocia controls will get activated only if the last point on the descent curve is lower than the Dystocia threshold set on the 'Options'. Dystocia can be used at any scenario if the controls are activated. Once the dystocia is set to 'On' and the labor starts, the warp factors for labor and perinatal monitor will change to real time once the descent curve has reached the preset dystocia threshold. Then with each contraction a "Turtle Neck Sign" will occur.

Descent

The descent curve represents the position relative to the ischial spine in centimeters, from -5 cm to 10 cm (station). The user can change this curve by clicking over the points on the line and dragging it to the desired location. In order to add more points on the line the user has to do a right click on the mouse and select "Add Point", and to remove points right click over the point and select "Remove Point".
**TIME LINE**

The time line is used to add palette items across the length of the labor to generate scenarios where the files are uploaded automatically during the labor. To add a palette item the user must do a right click over the time line and select 'Add Palette', this will open a window with all the palette items recorded previously.

Once the point is added the user can click over it and drag it to a specific place on the time line. By doing a double click over the point a window will appear with all the details of that specific palette item.

To remove a palette item from the time line right click over the point and select 'Remove Palette'.

The provider can remove all the palette items at once by pressing on the "Clear" button located at the left of the timeline, this might be useful when the providers are taking a different direction from the scenario previously thought. After clearing all the palettes from the timeline the instructor can change parameters from the 'Details', 'Palette', or even by adding palettes to the timeline.

**STAGES**

The stages are also dependant on the descent curve, these allow the instructor to have some feedback of the current state of the delivery. At the beginning of each stage there is a button that once clicked it will open a status window that will show the conditions for that particular stage.
The Log page allows the facilitator to keep track of every event during a session. It automatically creates an entry whenever a detected event occurs as well as every time there is a change on the patient condition. Also, the facilitator can log observed provider actions with a simple click.

The Log page consists of four different areas (from bottom to top): the text log, provider action buttons, team logging buttons, and session info.

**Provider Actions**

The Provider Actions section refers to the collection of buttons in the middle of the page. It allows the facilitator to accurately keep track of provider actions. The buttons are grouped into 6 groups: Basic, Trauma Care, Airway, Breathing, Circulation, and Medication. Anytime the facilitator clicks one of the buttons, a time-stamped log entry is generated with that particular action.

For example, if the 'Assess responsiveness' button is clicked when the session clock reads 00:07:24, the following entry is automatically generated:

"00:07:24  Action (Assess Responsiveness)"

**Medications**

The Medications section allows for easy and fast logging of drugs administration, including dose and route. The software comes preloaded with a set of commonly used drugs. Each of these drugs has a default dose unit and a default route for administration (which can be overwritten by just typing over). For example, for Adenosine the default dose unit is "mg" and the default route
is "IVP" (intravenous push). In order to enter, for example, that a provider administered 6 mg of adenosine via IVP, the facilitator just has to enter the text "ad" and the software automatically searches the drug list and displays the best match (if any).

After a drug has been selected, just clicking on the 'dose' text field automatically fills the units and route fields with the default values for that particular drug.

The facilitator then enters the dose and clicks on the 'Administered' button and a log entry is created (let's say the dose entered was '6'):

"00:05:43  Action (Medication Administered): Adenosine, 6 mg, IVP"

**Team Logging**

The Team Logging feature allows the facilitator to designate which member of the team performed a particular action. The Team Logging section is right above the Provider Actions section on the Log page. First, the facilitator should add all providers in the team, one by one, by clicking on the **Add** button and filling the **Add Provider** window.

As shown in the Log Page image (at the beginning of this page), a colored button is inserted on the Team Logging region for the provider just added. There can be up to 6 different providers, each with a corresponding button. Every time one of the provider buttons is clicked, that person becomes the active provider. To indicate the active provider, the vertical bars on each side of the Log page will match the color chosen for that person. On the Log Page image, for example, the provider "Charles Parker" is the active provider, so the vertical bars are teal colored. While there is an active provider, every time a Provider Action or Evaluation log entry is created it will have the name of the provider prepended to it as follows:

"00:07:41 [Charles Parker] Action (Check for pulses): radial"

To deactivate deselect the active provider and return to general logging, click the **Team** button and the vertical bars will return to neutral color. All provider buttons can be edited or deleted by right-clicking them and selecting an option from the menu.

**Session Info**

The session info area contains the 'Session Title' and 'Facilitator' fields at the top of the page. These fields are included when a
The Evaluation panel, always visible at the bottom of the GaumardUI window, allows the facilitator to insert standard evaluations or arbitrary notes into the log. The stylus device and hand-writing recognition technology makes annotating in real-time very fast and convenient.

Standard evaluations are given context by their position in the log relative to detected and observed provider actions. The following example illustrates this idea.

Note above that the provider “Mike” managed the bleeding with direct pressure and was then evaluated on that action.

The evaluation panel is part of the team-logging system, described previously. When a particular provider is selected, log entries generated via the Evaluation panel will be prepended with the provider’s name. For more information on Team Logging, see the previous section of this guide on Logging.

The Calibration Wizard allows you to easily calibrate the sensors inside the manikin. It can be accessed from the Setup pull-down menu in GaumardUI. As shown in the picture, first choose what function you would like to calibrate among chest compressions, artificial ventilations, blood pressure cuff, and defibrillation. The procedures for each function are described in the following sections.

**Chest Compressions / Artificial Ventilations**

Calibrating chest compressions and artificial ventilations:

In the Normal mode you will be calibrating the functions to your specific criteria, in other words, you will be telling the system what a correct chest compression or artificial ventilation is. Providers will be evaluated by the system based on this criteria. Please refer to the User Calibration section below for detailed instructions.

User calibration trains the GaumardUI software to evaluate providers based on the facilitator's criteria. In this mode, the software will ask the facilitator to perform a number of ‘correct’ procedures (chest compressions or artificial ventilations). The facilitator should follow the text cue on the screen and perform just ONE procedure at a time, until prompted for the next one.

For example, if calibrating chest compressions:
The wizard prompts the facilitator with a '#1'.
The facilitator performs one correct chest compression.
A green filled oval indicates that the chest compression was successfully recorded.
The wizard prompts the facilitator with a '#2'.
The facilitator performs one correct chest compression.
A green filled oval indicates that the chest compression was successfully recorded.
...and so on.

At the end of the calibrating session, the wizard shows the average peak, depth, and duration values for the procedure. If the facilitator feels he/she performed the procedures correctly, then click the 'Save' button. Otherwise, press the 'Back' button and repeat the procedure.

The GaumardUI has several options that can be preset by the instructor so that every time the software is used this options will remain the same. To access the 'Options' screen go to the 'Setup' menu.

**AUTO-RESPONSES**

Auto-responses can be used to free the facilitators attention. They also enhance realism by presenting instant reactions to the
care providers. On the other hand, sometimes it is not possible or desirable to determine the responses before the simulation begins. Different environments and applications call for different settings. For a more detailed explanation on how to use Auto-responses go to the bottom of Tips on Palette Item and Scenario Creation.

### MONITORS

Noelle can be connected to a virtual monitor that has both Maternal vital signs and fetal monitor tracings. The Monitors should connect automatically to the software because they are preprogrammed at the company to do so. In case they do not connect automatically the connection settings can be accessed on the 'Monitors' menu under 'Configuration...'.

Once the Virtual Monitors are connected, the instructor can turn On/Off each vital sign individually or they can be turned On/Off all at once.
CPR

Noelle can also be used as a teaching aid for CPR, so on the GaumardUI there are a couple of features that allow the instructor to get some feedback on how well the providers are doing the CPR. It is important to know that the chest compressions will only give feedback to the instructor if the heart rate is not set to a healthy state, and ventilations will only be reported if the respiration rate is set to zero.

Thinking in Terms of Palette Items

As described previously, Palette items represent complete or partial groups of settings that have been stored as a single item. We learned how applying partial states will hold constant all settings that are left unspecified.

Not only does it take time to customize the palette, but a very large palette becomes difficult to navigate. So, it is desirable to minimize the number of Palette Items in each Profile. To accomplish this, an experienced facilitator tries to create items that are as generally applicable as possible and can, thus, be applied to a wide range of scenarios. The key is to only include in your Palette Items the settings that are directly related to the physiological event represented by that Palette Item.

Smart Scenarios

After reading the Details, Palette, and Scenarios sections of this guide, it should be clear how to build a scenario. You may have already tried building your own or modifying some of the factory presets. The following four guidelines will refine your ability to build the best possible scenarios.
1. How will the scenario begin?

The first thing to consider is the initial condition of the patient. Create a Palette Item to describe this condition. Make sure that this first step in the scenario is a complete state. That is, indicate some selection for each and every available setting on the Details page. Remember that only the settings you specify will cause a change in NOELLE, and all other settings will remain constant. So, by starting with a complete state, NOELLE's condition will always be the same when the scenario starts, regardless of what he was doing previously.

Likewise, the "transition duration" of the first step in the scenario should be zero, indicating that changes are applied immediately.

There is one point that can cause confusion and warrants further explanation. It is an extension of the above discussion of partial states. The issue is best illustrated through the following example:

Suppose that you are creating a Palette Item to start your scenario. In this case, you have decided that the patient will be apneic. The question is, "How should the lung sounds be set?"

Most people's first inclination is to set the lung sounds to "none." This is incorrect, despite apnea. Obviously, no lung sounds should be heard during apnea, but since you have already set respiratory rate to zero, none will be. (Sounds are synchronized to the breathing cycle.)

What you are really setting here when you choose a lung sound is the condition of the lungs, given respiratory drive. That is, if the patient's respiratory rate were changed from zero, what sound would be heard? Assuming that the lungs themselves are normal in this scenario, you would choose "normal" for the lung sound setting.

Then, as the scenario progresses, if the patient starts breathing, there will be no need to set the lung sound again. It will already be set. The same principle applies to the heart sound and other settings.

2. Include notes to guide the facilitator during the simulation.

It is common for scenario designers, especially those who act as facilitators, to neglect the importance of notes in the scenario. They think that they will remember the learning objectives, patient history, and other details at the time they are ready to conduct the simulation. They usually don't, especially when revisiting a scenario months after creating it.

When you add "Wait" and "Wait Indefinitely" steps to a scenario, you have an opportunity to edit the item description. Use this description field to hold notes to the facilitator. Typically, scenario designers put notes there to indicate what the provider(s) or facilitator should be doing at that point.

Further, when saving the scenario, you may edit the scenario description. This is the best place to put patient history and any other longer notes and instructions.

3. Assume that providers will do the right thing.

Usually, you should create a scenario with the assumption that the providers will perform correctly. As long as they do, the scenario can simply be allowed to continue.

Naturally, you must be prepared for what might happen to NOELLE when providers deviate from expectations. The consequences of such deviations can sometimes be included in the scenario, punctuated by "Wait Indefinitely" items. In other cases, the simulation will require more direct control by the facilitator via either the Palette or Details page.

Examples…

4. Choose auto-response settings based on the scenario content and the objectives.

As you've seen, auto-responses can be used to free the facilitators attention. They also enhance realism by presenting instant reactions to the care providers. On the other hand, sometimes it is not possible or desirable to determine the responses before the simulation begins. Different environments and applications call for different settings.

Loosely structured teaching and practice is usually best done with the auto-response settings in Prompt mode. Responses must be triggered by a vigilant facilitator. Though it is slower and requires more attention, the benefit of Prompt over other modes is that the simulation can be allowed to go in any direction, and it will be possible to choose the response on a case-by-case basis.

Tightly structured teaching and assessment requires a higher degree of automation. For such applications, most facilitators
choose Auto mode for the auto-response settings. The key issue is standardized timing of symptom presentation. A consistent, repeatable simulation is essential for fair assessment of that care provider in relation to others and for the broader interpretation of results in the context of training validation studies.

When in doubt, it is best to choose Prompt mode, in which the facilitator will be given direct control of the responses as events are detected.

**FOLDER STRUCTURE**

**Folders**

- **Desktop**
- **My Documents**
- **My Computer**
  - **Local Disk (C:)**
    - **Program Files**
      - **Gaumard Scientific**
        - **Gaumard User Interface**
          - **manulins**
          - **profiles**
            - **Default Profile**
            - **Quick Start Scenarios**
          - **resources**

Advanced users may find it helpful to understand the GaumardUI directory structure. With direct file manipulation, one can easily move palette items and scenarios between profiles, as well as move entire profiles from one computer to another.

**Profiles**

In the GUI program folder is the 'profiles' sub-folder (e.g. 'C:\Program Files\Gaumard Scientific\Gaumard User Interface\profiles\'). All user information is saved there, and it is the only folder that should be modified manually.

**Palette Items**

Saved as '*.*.plt' files, palette items in each profile are located at the top-level of each profile folder.

To copy palette items from one profile to another, simply copy the .plt file found in the source profile folder. For example, if you want to copy the palette item 'Atrial Fibrillation' from the 'Facilitator A' profile to the 'Facilitator B' profile, simply copy the file 'Atrial Fibrillation.plt' from the '...\profiles\Facilitator A\' folder to the '...\profiles\Facilitator B\' folder.

**Scenarios**

Scenarios are stored as sub-folders within profile directories.

Scenarios can also be transferred between profiles by copying the scenario folder and its contents. For example, to copy the scenario 'Cardiac Arrest' from profile 'Facilitator A' to 'Facilitator B', just copy the folder '...\profiles\Facilitator A\Cardiac arrest' (and all of its content) to '...\profiles\Facilitator B\'.

⚠️ **NEVER**

* modify files in the 'resources' directory or those at the top-level of the 'Gaumard User Interface' directory.
* manipulate files or folders while the GaumardUI software is running.
* modify or delete '*.dll,' '*.scn,' or '*.sys' files.

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NEWBORN

NOTE: For a more detailed explanation of the software you can open the Help file located on the “Help” menu one you run the GaumardUI software.

DETAILS

It is best to think of controlling the Newborn simulator in terms of three levels of complexity: firstly Details, then the Palette, and finally Scenarios. The Details page is the first of the tab-pages found in the main area of the software window. This is the most simple form of control available to the facilitator. Note that, for each item in the Status panel, there is a corresponding field or control on the Details page.

Simply choose the settings you wish to change from the available fields and click one of the Apply buttons below. New settings will be applied over the time period indicated by the button's label. Click the NOW button to change Newborn condition instantly, or click one of the other Apply buttons to create a trend.

Some settings always get applied immediately, such as cardiac rhythm and breathing pattern, while numerical settings, such as heart rate and respiratory rate, can be easily made to transition gradually (linearly) from their current values to any target you specify. The right-most button can be customized to any transition time you require by clicking the part of the button labeled Edit.

As transitions are applied, the time remaining in the transition is displayed in the Clocks panel at the bottom of the program window.

PALETTE

The second level of control is the Palette tab-page. Each item on the Palette represents a complete or partial physiological state. The Palette page displays all of the Palette Items in the active profile. Each profile has its own separately customizable Palette. Create Palette Items with the Details page, as described previously.
Apply Palette Items using the buttons at the bottom of the page, exactly as changes to Newborn condition are applied on the Details page. Change Newborn vital signs and symptoms instantly by clicking to select a Palette Item and clicking the NOW button. Or, create a gradual transition in physiological state with one of the other Apply buttons.

Palette Items can be sorted with the View buttons found on the right side of the page.

Editing existing Palette Items is simply a matter of selecting the item you wish to modify and clicking the Edit button. You will be automatically be taken to the Details page, and the settings that comprise the selected Palette Item will be displayed. Change them as desired, and click the Save as Palette Item button.

Many of the functions related to Palette Items are also available by clicking the second mouse button (usually the right button) while the pointer is positioned over an Item. Note, when using the tablet computer, this is best done by holding the stylus button while tapping the screen.

For more information on customizing the Palette, see the Tips on Palette Item and Scenario Creation section of the appendix at the end of this guide.

### SCENARIO

The most advanced method of controlling the Newborn system is to build a Scenario, a sequence of Palette Items and delay periods. This is done on the third tab-page in the main area of the software window. The best way to think of a scenario is like a "playlist" of palette items. Consistent with this analogy, scenario controls at the bottom of the page look and behave just like traditional and software-based media players.
Scenarios let the facilitator automate most of the changes to Newborn's condition, so that their attention can remain on the providers' actions. The scenario system can also provide standardization of the patient's presentation of symptoms. For fair assessment of providers and any research application, such standardization is key.

**MODEL**

Cyanosis modeling is one of the most exciting features of Newborn. The physiological model controls all vital signs, forearm motion, and skin color and, depending on effectiveness of provider intervention, it will improve or deteriorate the state of Newborn. The model speed can be controlled through the Model warp-factor, which goes from 1 to 5 (1 representing real-time).
Physiological Modeling State

**Pause**: Model will pause at the current state.

**Improve**: Model trend to a healthy state. Once the model reaches the complete Healthy state, the model will go to Pause mode.

**Deteriorate**: Model will trend to a severe cyanotic state. If ventilations given to the neonate are of correct depth and between 40 and 60 per minute, the vital signs will improve. Otherwise, they will continue to deteriorate.

**Cyanosis Levels**

The facilitator can quickly jump to any of the 3 points in the state of the model.

**Healthy**: Neonate is pink with adequate oxygenation.

**Mild Cyanosis**: Neonate is blueish and vital signs are starting to deteriorate.

**Severe Cyanosis**: Neonate is blue, apneic and vital signs are rapidly worsening.

**Modeled Therapy**

**Improve Gain**: This allows the facilitator to increase or decrease the cyanotic response of the baby.

**Oxygen**: By selecting an oxygen rate, the baby will improve faster with proper ventilation.

**Epinephrine**: Select the desired epinephrine dose and then select 'Administer', immediately the heart rate of the Neonate should rise and the dose on board should start diminishing over time. The dose should be enough to increase the heart rate a small percentage in order to help the oxygen delivery in the system and therefore help improve the neonate with proper ventilation.

**Reset**: By selecting 'Reset' the oxygen flow and the epinephrine dose onboard will be eliminated.

**CPR Monitor**

The CPR monitor has two bar graphs and a real time display that give the user some feedback on the CPR given to Newborn. Both bar graphs have a label on the left that change color representing low (yellow), correct (green) and high (red) levels of treatment. At the same time the real time graphs also show each compression and ventilation.

**LOG**
The Log page allows the facilitator to keep track of every event during a session. It automatically creates an entry whenever a detected event occurs as well as every time there is a change in the patient’s condition. Also, the facilitator can log observed provider actions with a simple click.

Gaumard Monitors

The Noelle Virtual Monitors simulates a vital signs monitor attached to the simulated patient. The vital signs are synchronized through a wireless network between the facilitator’s computer, the CIM Boxes, and the computer running the monitor. Vital Signs Monitors allows the user to customize each trace independently of each other. Users can set alarms, time scales, boundaries and grid options. The following is an overview of the Vital Signs software:
The main menu for the Vital Signs is a button labeled "V" at the upper left corner of the screen. When pressed, a drop-down menu will appear with several options:

**Comm Setup...** : opens the communication settings for the Labor Monitor

![Communication Settings](image)

- Controller IP : displays the Instructor's computer IP address.
- Port : current connection port (both computers must be using the same port number). It is not usually necessary to change this setting.
- Connect/Stop button : click to start or stop communication
- 'connected' (green) / 'not connected' (red) / 'connecting' (yellow) : label to display connection status
- Hide button : closes the Communication Settings

**Performance...** : opens a window that displays the CPU usage and the refresh rate of the vital signs.

![Performance Monitor](image)

**Toggle Cursor** : hides or shows the mouse cursor.

**Help...** : opens the help files.

**About...** : opens information about software (Version #).

**Close...** : closes Labor Monitor.
The Vital Signs includes the following four scrolling waveforms with corresponding scalar values:

- ECG : Electrocardiogram
- IBP : Invasive Blood Pressure (radial)
- Resp : Respiration cycle
- CO2 : Carbon Dioxide

At the top-left of each trace is an identification label. At the right side is a number representing the current value or essential metric. Also, at the far right of each trace is a button labeled with the trace name, which display a drop down menu with customizable trace options.

Example Traces Menu : ECG - Menu
Each menu will have several options, and some of these options will expand into other options allowing the user to customize the trace in many different aspects.

The vital signs monitors also include four numeric's at the bottom which are:

- Temp : Temperature (it will be refreshed every minute)
- NIBP : Non-Invasive Blood Pressure (it will be refreshed every minute)
- RR : Respiration rate (works in correlation with the "CO2" trace)
- SpO2 : Oxygen saturation in Blood

Temp, NIBP, RR and O2Sat each have drop down menus with customizable options.

'All On/All Off' button: this button located on the bottom-right corner of the monitor turns ON or OFF all the vitals at once.
Both the Maternal and Neonatal vital signs have the ability to use a either a virtual AED, Defibrillator or a Pacer depending on the instructors request or providers judgment. On the upper left corner of each monitor there are three buttons that correspond to these virtual instruments. Each virtual instrument has its own properties, but the one thing in common is that all of them will make sure that the provider has connected the proper virtual pads to the Sim Box controlling either the mother or the neonate. (Note: The instructor has to make sure if both pads are being connected in the proper position, since the instruments give feedback of being connected, but not if placed in the proper place)

**AED**

The AED will check automatically the patients heart rhythm and it will instruct the provider to shock only if necessary.

**Defibrillator**

The defibrillator allows the provider to do synchronous or non-synchronous shocks at a wide...
range of energy values depending the application.

**Pacer**

![Pacer](image)

The pacer allows the user to set the pacing current and the pacing rate.

**Note:** Every time a shock has been done using either one of these three virtual instruments, it will be logged on the Instructors user interface.

**Quick Reference**

Alice - Normal Labor
- Stage 1, Active Phase
- Stage 1, Transition Phase
- Stage 2
- Stage 3

Beth - Variations on Normal Labor
- Stage 2
- Stage 3 (a) ................. .neonate in crisis
- Stage 3 (b) ................. .neonate stabilized

Cynthia - Shoulder Dystocia
- Stage 1, Active Phase
- Stage 1, Transition Phase
- Stage 2
- Stage 3 (a) ................. .neonate in crisis
- Stage 3 (b) ................. .neonate stabilized

Donna - Breech
- Stage 1, Transition Phase
- Stage 2
- Stage 3

Elaine - Preeclampsia
Stage 1, Latent Phase
Stage 1, Active Phase
Stage 1, Transition
Stage 2
Stage 3 (a) ..................neonate in crisis
Stage 3 (b) ..................neonate stabilized

Francine - Cesarean Delivery
Stage 1, Latent Phase
Operative ......................mother nauseated, neonate tachypneic
Post-operative ................mother sedated, neonate stabilized

Gloria - Cord Prolapsed
Stage 2
Stage 3

Helen - Hemorrhage
Stage 1, Active Phase
Stage 1, Transition Phase
Stage 2
Stage 3 (a) ..................mother hemorrhaging, neonate in crisis
Stage 3 (b) ..................mother stabilized, neonate condition improved
Stage 3 (c) ..................neonate stabilized

Irene - Preterm Labor
Stage 1, Latent Phase (a)
Stage 1, Latent Phase (b) .............contractions suppressed
Stage 1, Active Phase .........72 hours later, breakthrough contractions
Stage 1, Transition Phase
Stage 2
Stage 3 (a) .................neonate in crisis
Stage 3 (b) .................neonate condition improved

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Section 10 – Troubleshoot wireless connection

Computer to Computer wireless connection setup

Before starting to setup a communication between both computers make sure the both of them
are on. The procedure for setting up the wireless communication is the same for both
computers; the only difference is that in the step where an IP address is given to the computers,
each has to have a different IP address from the other one.

1. Locate the computer icon with the wireless waves next to it on the bottom right of the screen.
2. Do a Right-Click over the icon and select ‘View Available Wireless Networks’.

3. Once the ‘Wireless Network Connection’ screen opens, select ‘Change advanced settings’ that is located in the ‘Related Tasks’ group box at the lower left side of the screen.

5. On the ‘Wireless Network’ tab click on the ‘Add…’ button to open the ‘Wireless network properties’ screen. This is probably one of the most important steps so make sure to take note of the Network name, to repeat this same process on the second computer; the network name is case sensitive. Once a Network name has been written on the text box, select the ‘Disabled’ option on the ‘Data encryption’, then click OK.
6. Select the ‘General’ tab on the ‘Wireless Network Connection Properties’ and then click once over ‘Internet Protocol (TCP/IP)’ so that it is highlighted. Then click on the ‘Properties’ button.
7. On the ‘Internet Protocol (TCP/IP) Properties’ select ‘Use the following IP address’. IP Address: This number can be any number, except it has to be different from the number on the second computer. Subnet mask: 255.0.0.0

Once both the IP Address and the Subnet mask are set click OK and then click once again OK on the ‘Wireless Network Connection Properties’.

![Internet Protocol (TCP/IP) Properties](image)

Repeat the same process for the second computer, but make sure to assign a different IP Address. Once both networks have been setup, both computers should connect automatically.
If you have read this user's guide and still require assistance, it's easy to reach us.

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