High Tech Mannequins – Pediatrics

Laerdal SimBaby and SimNewB

The SimBaby is designed to simulate working with an approximately 6 month to 1 year old child while the Sim NewB should be used for a scenario that calls for a child of less than 10 days old. Each have a variety of features listed below for comparison. Here at NYSIM, the NewB is usually set up in an infant warmer while the SimBaby can be in a Transport Isolette (Draeger Caleo), in a carseat for prehospital scenarios or on a stretcher, depending on your needs for the scenario. Neither SimBaby nor SimNewB are completely wireless, however we are able to have the instructor in a separate control room from the learners. We have four SimBaby patients and one SimNewB newborn.

Please scroll all the way down for our congenital anomaly moulage set available for use with the SimNewB.

<table>
<thead>
<tr>
<th>Airway features</th>
<th>Baby</th>
<th>NewB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Airway occlusion (head tilt/chin lift, jaw thrust)</td>
<td>☑</td>
<td>NO</td>
</tr>
<tr>
<td>Obstructed airway simulation</td>
<td>☑</td>
<td>NO</td>
</tr>
<tr>
<td>Instructor controlled mechanical airway closure</td>
<td>☑</td>
<td>NO</td>
</tr>
<tr>
<td>Chest tube insertion - left midaxillary</td>
<td>☑</td>
<td>NO</td>
</tr>
<tr>
<td>Right mainstem intubation</td>
<td>☑</td>
<td>☑</td>
</tr>
<tr>
<td>Oral/nasal airway insertion</td>
<td>☑</td>
<td>☑</td>
</tr>
<tr>
<td>Endotracheal tubes - insertion, securing &amp; care</td>
<td>☑</td>
<td>☑</td>
</tr>
<tr>
<td>Intubation, Oral &amp; Nasal</td>
<td>☑</td>
<td>☑</td>
</tr>
<tr>
<td>Oro- &amp; nasopharyngeal airways - insert &amp; suctioning</td>
<td>☑</td>
<td>☑</td>
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<tr>
<td>Sellick maneuver</td>
<td>☑</td>
<td>☑</td>
</tr>
<tr>
<td>Oxygen delivery procedures</td>
<td>☑</td>
<td>☑</td>
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<tr>
<td>Suctioning techniques</td>
<td>☑</td>
<td>☑</td>
</tr>
<tr>
<td>Auscultation of lung sounds</td>
<td>☑</td>
<td>☑</td>
</tr>
<tr>
<td>Individual lung or bilateral sound selection</td>
<td>☑</td>
<td>☑</td>
</tr>
<tr>
<td>Needle chest decompression - Left Side Only</td>
<td>☑</td>
<td>☑</td>
</tr>
<tr>
<td>Stomach decompression</td>
<td>☑</td>
<td>☑</td>
</tr>
<tr>
<td>Laryngeal mask airway</td>
<td>☑</td>
<td>☑</td>
</tr>
<tr>
<td>Auscultation of lung sounds during ventilation</td>
<td>☑</td>
<td>☑</td>
</tr>
<tr>
<td>Lung sounds, synchronized with breathing rate</td>
<td>☑</td>
<td>☑</td>
</tr>
<tr>
<td>Meconium Aspiration Module</td>
<td>NO</td>
<td>☑</td>
</tr>
<tr>
<td>Co2 exhalation</td>
<td>☑</td>
<td>☑</td>
</tr>
<tr>
<td>Positive pressure ventilation</td>
<td>☑</td>
<td>☑</td>
</tr>
<tr>
<td>Airway complications (instructor controlled)</td>
<td>☑</td>
<td>☑</td>
</tr>
<tr>
<td>Realistic chest rise and fall</td>
<td>☑</td>
<td>☑</td>
</tr>
<tr>
<td>Feature</td>
<td>Baby</td>
<td>NewB</td>
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<tr>
<td>------------------------------------------------------------------------</td>
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<tr>
<td>Inflatable tongue edema</td>
<td>✓</td>
<td>NO</td>
</tr>
<tr>
<td>Pulse oximeter/SpO2 Saturation</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Instructor controlled ECG rhythm</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>ECG monitoring</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Defibrillation (manual/automatic)</td>
<td>✓</td>
<td>NO</td>
</tr>
<tr>
<td>Auto conversion of ECG w/defibrillation</td>
<td>✓</td>
<td>NO</td>
</tr>
<tr>
<td>Defibrillation sensors</td>
<td>✓</td>
<td>NO</td>
</tr>
<tr>
<td>Auscultation of heart sounds</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Cyanosis</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Heart sounds, synchronized with programmable ECG</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Spasm / Seizure</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Pacing</td>
<td>✓</td>
<td>NO</td>
</tr>
<tr>
<td>Blood pressure / pulses</td>
<td>Baby</td>
<td>NewB</td>
</tr>
<tr>
<td>Adjustable pulse strength</td>
<td>✓</td>
<td>NO</td>
</tr>
<tr>
<td>Pulses only active when palpated</td>
<td>✓</td>
<td>NO</td>
</tr>
<tr>
<td>Umbilical and right brachial pulses</td>
<td>NO</td>
<td>✓</td>
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<tr>
<td>Bilateral femoral, left radial and brachial pulses</td>
<td>✓</td>
<td>NO</td>
</tr>
<tr>
<td>Adjustable Heart rate</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Synchronized with ECG</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Pulse strengths dependent on BP</td>
<td>✓</td>
<td>NO</td>
</tr>
<tr>
<td>Adjustable bp levels (systolic/diastolic)</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Blood pressure auscultation</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Korotkoff Sounds, synchronized with ECG</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Blood pressure / pulses</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Circulatory skills and IV drug administration</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>Volume infusion</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Realistic flashback</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Umbilical cord catheterization</td>
<td>NO</td>
<td>✓</td>
</tr>
<tr>
<td>IV insertion</td>
<td>✓</td>
<td>NO</td>
</tr>
<tr>
<td>IO insertion</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>CPR</td>
<td>Baby</td>
<td>NewB</td>
</tr>
<tr>
<td>Anatomical landmarks</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Head tilt/chin lift sensors</td>
<td>✓</td>
<td>NO</td>
</tr>
<tr>
<td>Ventilation with bag-valve-mask</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Ventilation measurement and feedback</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Closed chest compressions</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Compression measurement and feedback</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Baby</td>
<td>NewB</td>
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<tr>
<td>-------------------------------------</td>
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</tr>
<tr>
<td>Gastrointestinal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NG Tubes - insertion, care and removal</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Gastrostomy tube - placement and care</td>
<td>NO</td>
<td>✔️</td>
</tr>
<tr>
<td>Eye features</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interchangeable pupils</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Gender, age, size</td>
<td>Baby</td>
<td>NewB</td>
</tr>
<tr>
<td>Pediatric - Approx 1 year old</td>
<td>✔️</td>
<td>NO</td>
</tr>
<tr>
<td>Newborn</td>
<td>NO</td>
<td>✔️</td>
</tr>
<tr>
<td>Female</td>
<td>NO</td>
<td>✔️</td>
</tr>
<tr>
<td>Full-body manikin</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Vocal sounds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-recorded vocal sounds</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Variable fontanelles</td>
<td>✔️</td>
<td>NO</td>
</tr>
<tr>
<td>Body movement</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Different sounds</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>NewB Congenital Anomaly Set:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foreceps Laceration Head Skin (1)</td>
<td>NO</td>
<td>✔️</td>
</tr>
<tr>
<td>Cleft Lip Head Skin (1)</td>
<td>NO</td>
<td>✔️</td>
</tr>
<tr>
<td>Cystic Hygroma Head Skin (1)</td>
<td>NO</td>
<td>✔️</td>
</tr>
<tr>
<td>Polycystic Kidney Modules (2)</td>
<td>NO</td>
<td>✔️</td>
</tr>
<tr>
<td>Myelomeningocele Module (1)</td>
<td>NO</td>
<td>✔️</td>
</tr>
<tr>
<td>Omphalocele (1)</td>
<td>NO</td>
<td>✔️</td>
</tr>
</tbody>
</table>
Gaumard HAL – 5-Year-Old

HAL is designed to simulate an early school age child, generally 5 – 7 years old. Our only African American patient, HAL is completely wireless and is operated from a tablet style computer that the instructor can easily carry. The mannequin control software is entirely touchscreen using a stylus.

<table>
<thead>
<tr>
<th>General</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetherless and fully responsive even while being transported</td>
</tr>
<tr>
<td>Powered from an internal rechargeable battery or wall outlet</td>
</tr>
<tr>
<td>Simulator receives commands from a wireless tablet PC and operates at distances up to 300 feet.</td>
</tr>
<tr>
<td>Simulator can operate automatically using optional Automatic Mode or by the Instructor</td>
</tr>
<tr>
<td>Training Guide with both basic and advanced interactive scenarios</td>
</tr>
<tr>
<td>Use pre-programmed scenarios, modify them or create your own quickly and easily</td>
</tr>
<tr>
<td>Installation and training worldwide</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Airway</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programmable airway</td>
</tr>
<tr>
<td>Tongue edema</td>
</tr>
<tr>
<td>Multiple upper airway sounds synchronized with breathing</td>
</tr>
<tr>
<td>Nasal or oral intubation</td>
</tr>
<tr>
<td>Right mainstem intubation</td>
</tr>
<tr>
<td>Sensors detect depth of intubation</td>
</tr>
<tr>
<td>Airway may be obstructed</td>
</tr>
<tr>
<td>Block right lung, left lung, or both lungs</td>
</tr>
<tr>
<td>Head tilt/ chin lift</td>
</tr>
<tr>
<td>Suctioning techniques can be practiced</td>
</tr>
<tr>
<td>Bag-Valve-Mask Ventilation</td>
</tr>
<tr>
<td>Placement of conventional airway adjuncts</td>
</tr>
<tr>
<td>Endotracheal intubation using conventional ETTs</td>
</tr>
<tr>
<td>Retrograde intubation</td>
</tr>
<tr>
<td>Sellick maneuver brings vocal cords into view</td>
</tr>
<tr>
<td>Perform tracheostomy</td>
</tr>
<tr>
<td>Tracheostomy care and suctioning</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Breathing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control rate and depth of respiration and observe chest rise</td>
</tr>
<tr>
<td>Automatic chest rise is synchronized with respiratory patterns</td>
</tr>
<tr>
<td>Select independent left and right upper lung sounds</td>
</tr>
<tr>
<td>Chest rise and lung sounds are synchronized with selectable breathing patterns</td>
</tr>
</tbody>
</table>
Accommodates assisted ventilation including BVM and mechanical support
Ventilations are measured and logged
Gastric distension with excessive BVM ventilation
Chest compressions generate palpable blood pressure waveform and ECG artifacts
Detection and logging of ventilations and compressions
Simulated spontaneous breathing
Variable respiratory rates and inspiratory/expiratory ratios
Bilateral chest rise and fall
Unilateral chest rise simulates pneumothoraces
Normal and abnormal breath sounds

**Cardiac**

ECGs are generated in real time with physiologic variations never repeating textbook patterns
Heart sounds may be auscultated and are synchronized with ECG

**Circulation**

Measure blood pressure by palpation or auscultation
Use real modified BP cuff to measure blood pressure
Korotkoff sounds audible between systolic and diastolic pressures
Pulse sites synchronized with BP and heart rate
Bilateral IV arms with fill/drain sites
Realistic flashback
SubQ and IM injection sites
Intraosseous access at tibia
Chest compressions are measured and logged
ECG monitoring using real devices
Defibrillate, cardiovert and pace using real devices
Multiple heart sounds, rates and intensities
ECG rhythms are generated in real time
Heart sounds synchronized with ECG
Dynamic rather than static 12 lead ECG display available with Automatic Mode
Pacing may be practiced anteriorly to avoid having to roll the patient during delivery
Bilateral carotid, radial, brachial and femoral pulses synchronized with ECG
Pulses vary with blood pressure, are continuous and synchronized with the ECG even during a paced rhythm

**Neural Responses**

Eyes are controlled automatically by physiologic model or directly by the Instructor
Eyes open and close
Select blink rate
Select pupillary response to light
<table>
<thead>
<tr>
<th>Speech</th>
<th>Pre-recorded sounds and speech in child’s voice</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Optional wireless streaming audio</td>
</tr>
<tr>
<td><strong>Articulation and Movement</strong></td>
<td></td>
</tr>
<tr>
<td>Seizure/convulsions</td>
<td></td>
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<tr>
<td>Realistic rotation of the shoulder and hip joints</td>
<td></td>
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<tr>
<td>Legs bend at the knees</td>
<td></td>
</tr>
<tr>
<td>Supine or semi-recumbent positions</td>
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<tr>
<td><strong>Other</strong></td>
<td></td>
</tr>
<tr>
<td>Central cyanosis</td>
<td></td>
</tr>
<tr>
<td>Fill bladder and perform Foley catheterization</td>
<td></td>
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<tr>
<td>Interchangeable genitalia</td>
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<tr>
<td>Insert feeding tubes</td>
<td></td>
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<tr>
<td>Remains fully functional even while in transit</td>
<td></td>
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<tr>
<td>Bowel sounds</td>
<td></td>
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<tr>
<td><strong>User Interface</strong></td>
<td></td>
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<tr>
<td>Sensors track student actions</td>
<td></td>
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<tr>
<td>Changes in condition and care provided are time stamped and logged</td>
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</tr>
<tr>
<td>View the actions of up to 6 care providers using a responsive menu or write narrative</td>
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<tr>
<td>Generate and share diagnostic lab results</td>
<td></td>
</tr>
<tr>
<td>File sharing through Vital Signs Monitor</td>
<td></td>
</tr>
<tr>
<td>Links with optional Pro+ recording and debriefing system integrating the event log with cameras and patient monitor</td>
<td></td>
</tr>
<tr>
<td>Supplied with wireless tablet PC</td>
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</tr>
<tr>
<td>12 pre programmed scenarios which can be modified by the instructor even during the scenario</td>
<td></td>
</tr>
<tr>
<td>Create your own scenarios - add/edit</td>
<td></td>
</tr>
</tbody>
</table>
Moulage

NYSIM has the capability for a wide range of moulage to be applied to our mannequins. Use of moulage increases realism for the scenario and helps further emotionally engage the learner. In addition to the SimNewB congenital abnormalities listed in the Laerdal SimBaby and SimNewB (LINK) section above, we have the Moulage Kit by CAE Healthcare, which can be used to simulate traumatic injuries with any of our patient simulators from burns to fractures and lacerations.