SIM CHARACTERS
HIGH EMOTION SIMULATION

HELLO PAUL

The world's first
High Emotion preterm simulator
for realistic critical care training
in neonatology

HighEmotionSimulation

@SIMCHARACTERS

www.simcharacters.com

Why neonatal simulation training?

1 in 10 infants are born premature. Providing high quality care for a preterm baby is a uniquely complex and time-sensitive process which is extremely challenging for inter-professional neonatal healthcare teams. Although preterm birth remains the most common cause of death among infants, preemies weighing only 500 to 1,000 grams can survive as healthy babies when cared for by highly trained healthcare professionals.

Yet how can these professionals effectively learn life-saving procedures during such delicate critical care emergencies? Simulation is quickly becoming the modern way to educate and train healthcare professionals because it allows for the safe high-stakes practice of behavioral, cognitive and technical skills. Previously, such realistic technology had been impossible in the small body of a 27-week-old infant.

Moving beyond high fidelity to High Emotion

Determined to improve the outcomes of more than 15 million preterm births a year, Neonatologist Dr. Jens Schwindt founded SIMCharacters in 2012. With Paul, SIMCharacters is taking the next step in the future of medical simulation.

Paul was designed by an incredible team of leading experts in neonatology, education, simulation, engineering, software development, and movie special effects – all of whom shared the same goal of creating a premature simulator so realistic that it went beyond high fidelity to High Emotion.

The SIMCharacters team knows that creating High Emotion Simulation requires understanding and empathy with the teams, families, and programs caring tirelessly for preterm newborns.

"Our mission at SIMCharacters is to improve the quality of care for critically ill preterm and newborn babies by advancing the realism and effectiveness of training simulators."
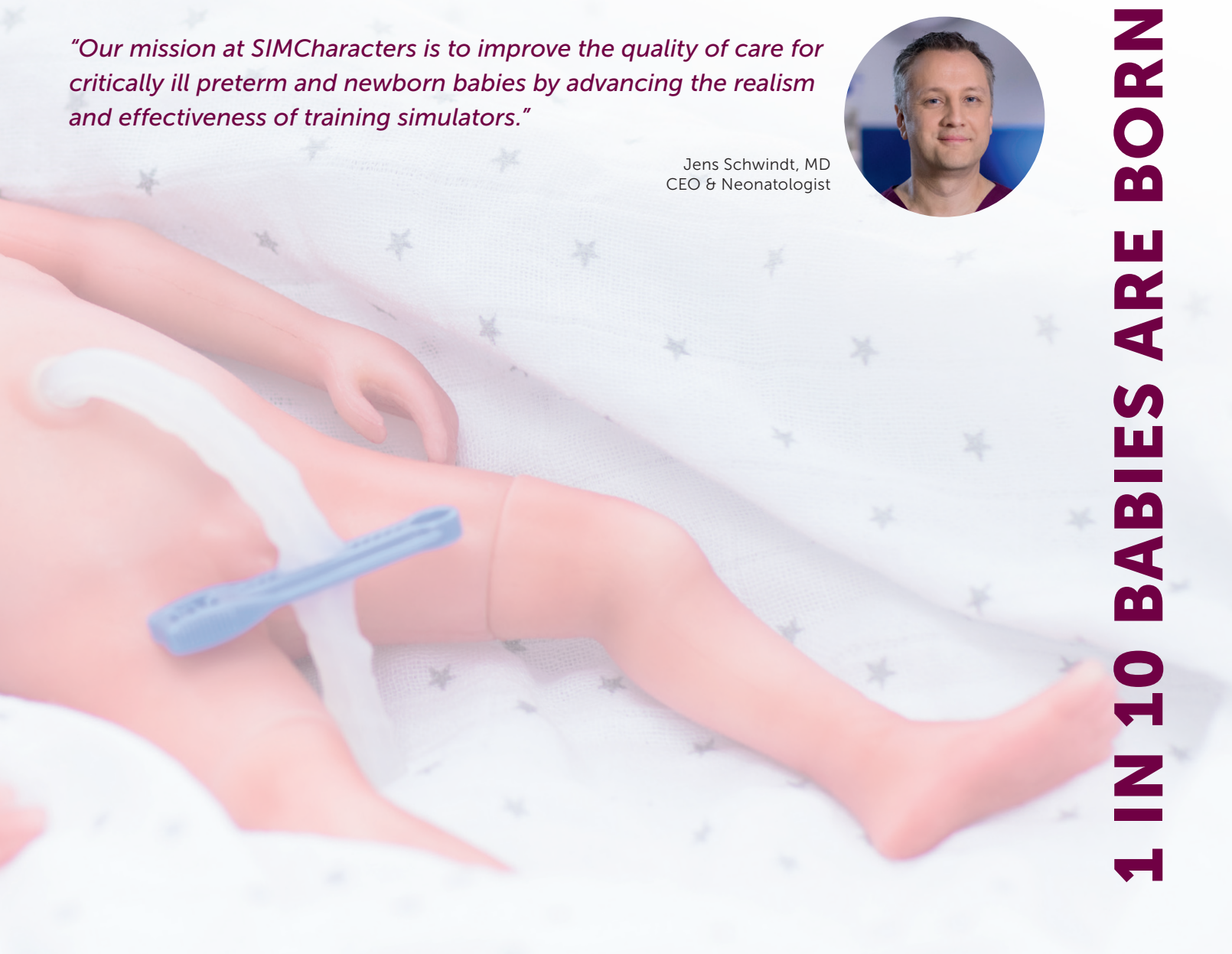
Jens Schwindt, MD
CEO & Neonatologist

1 IN 10 BABIES ARE BORN PREMATURE

The world's most advanced patient simulator

Measuring only 35cm and weighing less than 1,000g, Paul is the most accurate recreation of a preterm baby born in the 27th week of pregnancy. Paul provides next-generation preterm simulator features including an anatomically correct 3D printed larynx based on real-life preterm MRI scans, physiological and pathological breathing patterns, highly realistic internal and external anatomical structures, and convincingly lifelike clinical practice features.

Paul was designed specifically to improve the realism and learning outcomes of your NICU team and will forever change the way neonatology trains.

"Working with such a realistic simulator creates an interprofessional team training event which goes beyond high fidelity, to high emotion."

Martina Stix
Neonatal Nurse Practitioner
General Hospital Vienna

HIGH EMOTION SIMULATION

Pathological breathing patterns
(seesaw breathing,
paradoxical respiration,
substernal retractions,
grunting)

Cyanosis and hyperoxia

Highly realistic upper airway, ideal
for practicing endotracheal intubation
and special neonatal care strategies
(MIST, INSURE)

Ventilation using
bag-mask and Neopuff systems

Automatic tube position detection
during intubation

Auscultatory respiratory,
heart, lung and intestinal sounds

→ **Realistic anatomy:** Paul represents a premature newborn born at 27 weeks with realistic internal and external anatomy including the most realistic 3D printed larynx ever seen.

→ **Authentic pathologies:** Pathologies specific to preterm babies with physiological and pathological breathing patterns (RDS, BPD), NEC, cyanosis, and hyperoxia.

→ **Completely wireless:** Enables highly realistic premature critical care training for improved learning and patient safety outcomes with 1.5 hours of battery use.

"Paul's airway is absolutely realistic – you think you are intubating a real infant. Paul will forever change the training of neonatologists."

Prof. Martin Wald, MD
Head of Neonatology
Paracelsus University Salzburg

Physiological and pathological
lung parameters for
machine-assisted ventilation

Sensors to detect the
correct position and depth of
an umbilical venous catheter

Palpable pulse on the umbilical cord
and all four extremities

Replaceable extremities

Simple controls for complex scenarios

Paul's undockable control tablet demonstrates learner actions with real-time 3D animations. Easily review real-time displays of all preterm simulator conditions including chest compressions, tube depth, UVC position, and motion artifacts. Single touchscreen buttons enable simple controlling of complex scenarios with the ability to quicksave patient states and easily rearrange scenario files. Modify vital signs and add annotations with Paul's intuitive smartphone-like touchscreen.

The SIMCharacters patient monitor offers you the ability to select layouts based on leading manufacturers, including Dräger, Philips, and Nellcor, to enable your simulation program to train with the patient monitor layouts you are most comfortable with. Simply touch the screen of the patient monitor or your control tablet to change layout style, settings, and functionality.

→ **3D Animated Control:** Paul's animated GUI displays synchronized graphical representations of learner actions as they happen.

→ **Simple programming:** Easily create and quicksave the desired patient state and string them together with time modifiers to easily create new scenarios.

→ **Real patient monitors:** Instantly change layout screen to preferred manufacturer. Wirelessly change monitor parameter displays such as curve position and color.

→ **Integrated annotations:** Data collected from learner interactions with Paul, such as UVC insertion, combine with your custom annotations to be automatically recorded into Paul's debriefing log.

"Paul provides new residents with a unique and safe learning opportunity before they ever touch a premature baby."

Claudia Lindtner, MD
Resident in Neonatology
Medical University Vienna

HIGH EMOTION CONCEPT
→ Preterm baby in 27+3 gestational week
  – Weight: 1,000g, Length: 35cm,
    Head circumference: 26cm
  – Highly realistic external anatomy
  – Real hair
  – Realistic to the touch
→ Skin color changes to simulate cyanosis (blue) and hyperoxia (red)
→ Realistic spontaneous respiration and respiratory pathologies
→ Completely wireless operation
→ Recharged via inductive charging pad
→ 1.5 hours of mobile battery use

AIRWAY
→ Highly realistic upper airway
→ Oral and nasal intubation
→ Ideal for training endotracheal intubation, LISA (MIST) and INSURE

NORMAL RESPIRATION
→ Physiological lung with realistic values under machine-assisted ventilation
→ Spontaneous breathing with respiratory rate variable between 0 and 100 bpm

PATHOLOGICAL BREATHING
→ Infinitely variable lung compliance
→ Inverted breathing
→ Subcostal retractions
→ Pathological respiration noises (grunting)
→ Pneumothorax

CIRCULATION
→ Palpable pulse on all four extremities and on the umbilical cord
→ Thorax compressions
→ Insertion of peripheral catheters in all four extremities (exchangeable)
→ Insertion of umbilical venous catheter (exchangeable umbilical cord)

SENSORS
→ Sensor for head position
→ Detection of the tube in the trachea or oesophagus
→ Detection of the tube depth
→ Automatic under ventilation of the left lung if catheter is inserted too deeply into the right main bronchus
→ Effectiveness of thorax compressions
→ Detection of umbilical cord transection
→ Detection of the umbilical venous catheter and the penetration depth

AUDIBLE EFFECTS
→ Crying
→ Amniotic fluid
→ Grunting

STETHOSCOPE
→ Position-dependent auscultation of respiratory, heart and stomach noises via the BlueTooth stethoscope provided

TRAINER'S LAPTOP
→ Inputs via touchscreen, or keyboard and mouse
→ SurfaceBook tablet detachable from keyboard for on-site training
→ Manikin operated via WiFi

GRAPHIC USER INTERFACE (GUI)
→ 3D animation of the manikin on the GUI
→ Real-time display of all physiological and pathological processes and therapeutic interventions (e.g. mask ventilation and intubation)
→ Automatic transfer of events and manikin status to the debriefing interface
→ Ability to add annotations via the debriefing interface
→ Automatic integration with a SIMStation audio-video debriefing system®

PRECONFIGURED PATIENT MONITORS
→ Dräger, Philips, Nellcor
→ Easily switch between monitor types via the trainer monitor
→ User-defined configuration and use corresponding to the interface of the original monitor
→ Touch-screen function
→ Various monitor sizes
→ ECG motion artefacts

PROGRAMMABLE SCENARIOS
→ Preprogrammed symptoms (RDS, BPD, NEC, apnoea)
→ Intuitive programming of scenarios via Quicksave function
→ Easy access to factory settings and scenario progressions

TRANSPORT
Trolley for transporting the entire system

TECHNICAL SERVICES
→ On-site installation
→ Guarantee extension & maintenance program:
  Extend your SIMCharacters standard warranty to two years for all parts and labor. The two year program includes one general refurbishment of the simulator during the contractual term. The five year program includes two general refurbishments of the simulator during the contractual term. These refurbishments include a full check of all functions and the refurbishment and preventative exchange of parts subject to wear and tear. The checks, maintenance work and repairs are performed by SIMCharacters. All of the shipping costs are also covered by SIMCharacters.
  If necessary, we will provide you with a fully functional replacement system for the period of time that your system is being refurbished or repaired by SIMCharacters. This will be shipped to you within one working day. Free software updates.

SIMCHARACTERS CARE

OVERVIEW OF PAUL'S FEATURES