Section I: Proposal name and contact information

Title / name of proposal:	The RespiSim Education Package-PRO
Contact person name and title:	Mary Yacovone MEd, RRT, BSRC Program Director
E-mail address:	mlyacovone@ysu.edu
Phone number:	(330) 941-1764

Section II: Approvals of the appropriate College Dean and/or Division Officer

To certify that the proposal is aligned with the strategic objectives of the department, college or division, signature approvals are required by the appropriate Department Chair or Director, College Dean, and/or area division officer, i.e., Provost, Vice President, Associate VP.

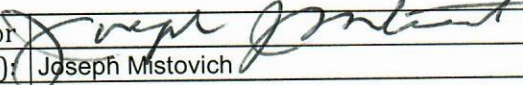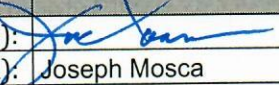|	
Signature of Dept. Chair or Director	
Name (printed/typed):	Joseph Mistovich
Title:	Dept. Chair
Date:	1-30-18
Signature of Dean (if applicable):	
Name (printed/typed):	Joseph Mosca
Title:	Dean
Date:	1/30/18
Signature of Division Officer:	
Name (printed/typed):	Martin Abraham
Title:	Provost
Date:	1-31-18

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Template for Strategic Investment Funding Proposals, FY 2018

Proposals must be submitted to the YSU Budget Office, no later than February 1, 2018

Section II: Description of the proposal and its alignment with the YSU 2020 Strategic Plan

Please summarize the proposal and specify how it aligns with the YSU 2020 Strategic Plan.

See Attached

Section III: Shared governance and stakeholder engagement

Was the proposal developed collaboratively and with input from all stakeholders? Please describe the process used to develop your proposal.

The Bachelor of Science Respiratory Care Advisory Board, which is comprised of respiratory care representatives from all of the local hospitals; The Cleveland Clinic; The Ohio State University Medical Center; University of Pittsburgh Medical Center; Akron Children's Hospital; Dr. Tejinder S. Bal, Program Medical Director; Department of Health Professions Chairperson; Respiratory Care faculty, students, and graduates; have indicated its overwhelming support for submission of the proposal seeking funding for the RespiSim. (See attached Letter of support from Respiratory Care Program Advisory Board Chair Bonnie Powell)

YOUNGSTOWN STATE UNIVERSITY

Template for Strategic Investment Funding Proposals, FY 2018
Proposals must be submitted to the YSU Budget Office, no later than February 1, 2018

Section IV: Return on Investment

> If applicable, describe how the proposal may generate new revenue to support related expenses or other strategic initiatives. If there are benefits other than revenue-generation, whether tangible or otherwise, you may also describe those.
>
> The RespiSim will provide the necessary technology to meet the advances dynamic demands of the respiratory care profession and delivery of the most current technologies in healthcare. Ultimately, it will be the public who benefits the greatest.

Section V: Proposed funding amount requested (NOTE: Available strategic investment funds are one-time dollars left over from the prior fiscal year. Consequently, proposals requiring multi-year funding will require additional consideration.)

Single year funding request:	$96,743.50		
Multi-year funding request (if applicable):	$	No. of years:	

Section VI: Space utilization and/or modification

> If applicable, describe any special and/or additional building or space requirements that would be needed to pursue your proposal.
>
> Not applicable

Section VII: Personnel costs / additions

If applicable, explain any additional costs associated with the need to add staffing and/or faculty resources required to pursue your proposal.

Not applicable

Section VIII: Enterprise risk management

If applicable, describe the risk mitigated by your proposal, or the risk elevated if your proposal is not funded.

Not applicable

Section II: Description of the proposal and its alignment with the YSU 2020 Strategic Plan

Description of proposal: The RespiSim Education Package-PRO proposal is to provide for clinically enhanced respiratory care education and psychomotor performance in advanced airway management and mechanical ventilation. The recent renovation of the Respiratory Care lab now supports the addition of such equipment designed to provide a high fidelity simulation experience to better prepare the Respiratory Care students for their practice in the clinical setting while working with critical care patients in intensive care units. In addition, the simulation equipment provides much greater opportunities for research that often involve collaborative projects with other faculty, campus departments, and clinical sites. With the continuous advancement of healthcare equipment, especially mechanical ventilators, it is necessary for the program to prioritize requests when funding is made available thought the Department and College for capital equipment purchases. This priority often involves the need to purchase the most up-to-date and state-of-the-art ventilators, which range in cost of $100,000 to $150,000 each, to ensure the students are able to function competently and efficiently when sent to the clinical sites. Limited funding resources historically have and will continue to prevent the program's ability to purchase advanced simulation equipment while maintaining up-to-date equipment in the laboratory. Therefore, the opportunity to submit this proposal for potential funding of the RespiSim Education Package-PRO is truly appreciated.

The Respiratory Care graduates' performance is already recognized as being exceptional. As an example, our graduates constantly exceed the national pass rates on the board exams. The most recent results are 100% pass rate on the Certified Respiratory Therapist (CRT) board exam and a 93% pass on the Registered Respiratory Therapist (RRT) board exam. Our graduates are constantly and actively recruited not only within our local region but by The Cleveland Clinic Foundation, The Ohio State University Medical Center, University of Pittsburgh Medical Center, Akron Children's Hospital, and Cincinnati Children's Hospital Medical Center.

The constant changes and advances in the respiratory care profession necessitate high fidelity simulation. Thus, funding for the RespiSim is imperative to the Respiratory Care students' ability to achieve and maintain the highest level of competency in clinical practice to enhance their success and to effectively contribute to the mission of respiratory care. In addition it will provide these students with opportunities to participate in collaborative research and regional engagement. Most importantly, the critical care patient will benefit the most from students and graduates having high fidelity simulation that allows them to hone their psychomotor skills and competence prior to practicing in the actual clinical environment.

For further information about the RespiSim Education Package-PRO please view the brief demonstration video: RespiSim System Tension Pneumothorax Scenario.

STRATEGIC INVESTMENT FUNDING PROPOSAL FY 2018
The RespiSim Education Package-PRO

Alignment with the YSU 2020 Strategic Plan: The purchase of the RespiSim Education Package-PRO aligns with the 2020 Strategic Plan in Student Success, Urban Research University and Transition and Regional Engagement.

Student Success

- Providing high fidelity simulation through the RespiSim will directly impact the clinical effectiveness of the student, which translates into better prepared graduates.
- Satisfaction with the academic experience can lead to higher achievement. Engaged and satisfied learners are often more successful learners.
- Training on the RespiSim will enable students to graduate with enhanced and refined psychomotor skills that increase their marketability in the employment arena. Also, this enhanced level of study may increase their likelihood to purse advanced education in the Master of Respiratory Care program.

Urban Research University Transition

- The RespiSim will lead to greater integration of research opportunities at the undergraduate level.
- The RespiSim will provide for greater faculty and student collaboration with respiratory professionals to improve patient outcomes.

Regional Engagement

- Integration of the RespiSim into the program will have a positive impact on the general health and wellness of the community. BSRC program graduates provide direct services to the community. Additionally, graduates of YSU's health and human services programs work in the region. Students and faculty collaborate with health organizations to prepare students to enter their chosen careers and benefit the community in turn.

Neonatal Intensive Care Unit

January 30, 2018

Dear YSU Budget Advisory Council,

I am sending this letter on behalf of the Advisory Board for the Bachelor of Science in Respiratory Care Program to support the submission of the Strategic Investment Funding Proposal submitted by the Program Director Mary Yacovone MEd, RRT. The board understands that the submission is for the RespiSim Education Package-PRO. The addition of this educational simulation equipment will permit the students to experience a true-to-life environment of ventilator and airway management at Youngstown State University. This equipment will ensure that respiratory care students can maintain, as well as enhance, their skill sets with the current and future technologic advances related to ventilation and airway management in the field of respiratory care. The advisory board also recognizes that this state of the art technology would increase the student's preparation for clinical practice and enhance research endeavors. The outcomes from the purchase of this equipment strongly support the goals of continued growth and excellence that the Bachelor of Science in Respiratory Care Program brings to the community and region that its serves.
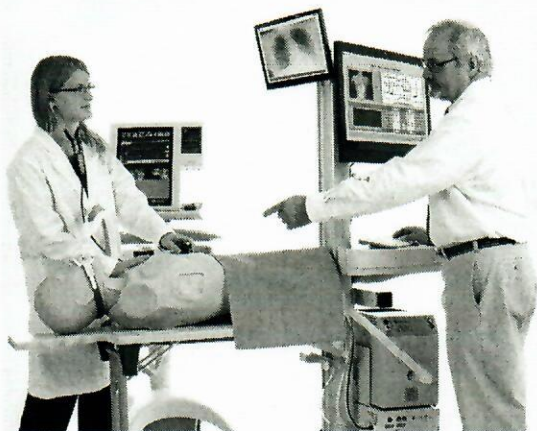
Sincerely,

Bonnie Powell, MSRC, RRT-NPS

Manager of Respiratory Services, Akron Children's Services

Bachelor of Science in Respiratory Care Program Advisory Board Chair

Intended applications: Advanced respiratory care training from airway management to mechanical ventilation

Example customers: Respiratory care and anesthesiology educators, simulation center directors and managers, pulmonary or critical care physicians, nursing, and emergency medical services

o **Ventilator-grade spontaneous breathing**
  o Ventilator recognizes the breaths produced by the ASL 5000 as it would a real patient – enabling highly realistic training!
  o Works with all modes of ventilation including Pressure/Volume Control, Pressure Support, APRV, PAV, HFOV, NIV, etc.
  o Sophisticated control of breath timing (I:E ratio)
  o Conduct advanced ventilator management scenarios such as patient-ventilator dysynchrony, weaning trials, and waveform analysis
o **Connect to any ventilator –** just as you would a real patient
o Simulate a **wide, minutely adjustable range of basic lung mechanics**
  o Compliance - 0.5 to 250 mL/cmH$_2$0
  o Resistance - 3 to 500 cmH$_2$0/L/s
o **Demonstrate the treatment effects of holding PEEP**
  o Including values > 20 cmH$_2$O
o **36+ pre-programmed respiratory conditions** with variable levels of severity include Asthma, ARDS, Bronchopulmonary Dysplasia (BPD), COPD, Cystic Fibrosis, etc.
o Create and save an unlimited number of user-defined respiratory conditions (examples: pneumothorax, bronchospasm, pneumonia, flash pulmonary edema, and many more)
o Simulate **neonatal through adult** patients (manikin integration available for adult patients only)
o **Seamlessly change any lung parameter during the scenario** remotely
o Control **sophisticated respiratory mechanics** such as non-linear compliance curves with inflection points, inspiratory vs. expiratory resistance, forced exhalation, and two compartment lung models
o **Train the full range of airway and ventilator management skills** including CPR, intubation, BVM ventilation, identification of tracheal deviation and jugular vein distension, needle decompression, chest tube insertion, surgical skills, and more (RespiPatient required)
o Includes mechanical ventilation **curriculum modules, vital signs, ABGs, x-rays, breath sounds, and a respiratory-based manikin simulator**

Respiratory Simulation Specialists
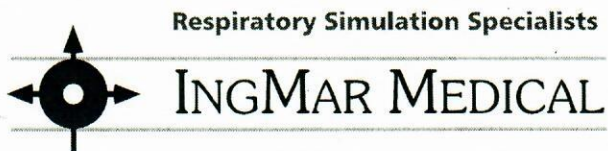
IngMar Medical

5940 Baum Boulevard
Pittsburgh, PA 15206 USA
Tel: 412-441-8228
Toll Free: 800-583-9910
Fax: 412-441-8404
www.ingmarmed.com
info@ingmarmed.com

RespiSim® Educational Package - PRO

With the *PRO* package, IngMar Medical has created a *comprehensive* respiratory flight simulator that enables intuitive, interactive, and highly effective training. This package combines the **ASL 5000 Breathing Simulator**, our RespiSim software designed to simplify and enhance simulation management, and the world's first respiratory-based manikin, **RespiPatient®**. With these components, students are immersed in a true-to-life environment where they assess chest rise, lung, heart and bowel sounds, x-rays, ABG values, and waveforms before treating their patient.

Additionally, two day on-site training with a respiratory therapist and **The Initiation of Mechanical Ventilation** (package of 10 curriculum modules) are included to help instructors hit the ground running with their simulations. All of the components, including a 23" touchscreen computer, are contained on a mobile cart for a compact, highly efficient ventilator management training workstation.

The Lungs: ASL 5000 Breathing Simulator

A high-fidelity, digitally controlled respiratory "flight simulator" that allows you to train for the highest level of patient care, with any ICU ventilator.

- *Ventilator-grade spontaneous breathing* means the ventilator cannot tell the difference between the breaths produced by the **ASL 5000** and those of a real patient
- *Simulate any respiratory patient scenario* including disease states and deteriorating/improving patient states
- *Build your own patient* or run one of 36 pre-configured patient models (apnea, chronic bronchitis, emphysema, neonatal obstruction, neonatal chronic lung disease, adult severe asthma, pediatric asthma, and more!)
- Seamlessly *change any lung parameter during the scenario* remotely
- *Advanced patient modeling* including non-linear compliance curves with inflection points, inspiratory vs. expiratory resistance, forced exhalation, and two compartment lung models

- *Reproducible Patients* ensure consistent instruction and skills assessment
- Dedicated Control Module (all-in-one touchscreen computer and wireless keyboard)

RespiSim Software

The RespiSim Software enhances the use of the **ASL 5000 Breathing Simulator** as a ventilator management teaching system. The software allows instructors to stay in control of the simulation and gives students the full view of patient-ventilator interaction, from vital signs to x-rays, in structured, multi-stage simulations. Features include:

- *Instructor Dashboard* for easy and comprehensive control over all aspects of the simulation
- *Rich debriefing environment* including recordings of entire sessions with waveforms and event markers
- *Vital signs monitor to display lab results, x-rays and ABG values*

RespiSim Curriculum

Developed in collaboration with leading educators, Curriculum Modules save instructors time by providing a comprehensive, multi-media package of materials that describes and demonstrates a concept or scenario within the subject of mechanical ventilation. The RespiSim *PRO* Package *Includes Initiation of Mechanical Ventilation Modules (package of 10)*. Each Curriculum Module includes:

- *Scenario Concept Presentation* video to prepare students for the hands-on simulation
- *Instructor Guide* with step-by-step instructions and learning objectives for the multi-stage simulation
- Pre-loaded, editable *patient models* to accompany the multi-stage simulation

The Manikin: RespiPatient

Train the full range of airway management and CPR skills with an anatomically correct airway, rib cage, "real feel" skin covering, realistic unilateral and bilateral chest rise and CO_2 production for capnography. Replaceable three layer tissue sets allow each learner a life-like and unique experience for training:

- Oral and Nasal Intubation
- Chest tube insertion
- Needle decompression of automated tension pneumothorax
- Needle and surgical cricothyrotomy
- Percutaneous tracheotomy
- Identification of tracheal deviation and jugular vein distention
- Bag-mask ventilation
- Inflatable tongue for simulation of difficult airway & breakaway teeth
- Includes hard sided transport case

RespiPatient CO2 Kit

As part of the RespiSim Educational Package - PRO, you can generate realistic CO2 waveforms for a wide variety of patient types with the RespiPatient CO2 Kit. CO2 flow can be set between 0-600 mL/min, representing metabolic rates from neonatal to adult patients. The RespiPatient CO2 Kit includes a mixing chamber inserted between RespiPatient manikin and ASL 5000 Breathing Simulator, for rendering true-to-life waveforms that can be monitored with any capnography equipment (ventilator or stand-alone monitor). The CO2 kit requires a high pressure (25 psi; 1.7 bar) CO2 source (not included).

16" USB Monitor

A "student facing" 1366 x 768 resolution LCD monitor to display the vital signs monitor with x-rays, and ABG values. Can be used on a tabletop or mounted on the Mobile Cart.

RespiScope (Lung and Heart sounds):

Enables realistic practice and mastery of advanced auscultation skills critical for diagnosis. Lung, heart, and bowel sounds are provided. The learner must place the dedicated WiFi stethoscope in the correct anatomical location to trigger the sound from a scenario-based playlist.

RespiPatient Mobile Cart

A highly efficient and organized workstation for all components of the RespiSim System. The mobile cart integrates the **ASL 5000** and **RespiPatient** for in-situ simulation training, wherever the students are located. This enables on-site training or the rehearsal of critical patient ventilation using real patient data right in the treatment unit.

Two Day on-site training

* Installation of the **ASL 5000 Breathing Simulator** including all hardware and software
* Creating lung models and running scripts
* Saving and analyzing data
* RespiSim set-up
* Using the Scenarios
* **RespiPatient** set-up/integration

❖ This program has been approved for 14 contact hours Continuing Respiratory Care Education (CRCE) credit by the American Association of Respiratory Care.

❖ It may also be submitted for recertification for the Society for Simulation in Healthcare's Certified Healthcare Simulation Educator (CHSE) and Certified Healthcare Simulation Operation Specialist (CHSOS) profession.

SUGGESTED OPTIONS not included in the package

Ventilator Interface Kit

Retrieval of all ventilator parameters (including alarm information and mode settings) for recording and debriefing. Compatible with ventilators from all major manufacturers. (requires RespiSim Software to operate).

Payment Terms (pending credit approval):

We kindly request a 30% deposit with the placement of the order.
The balance is due 30 Days from date of product delivery
For international orders we request prepayment

Warranty: 1 year from date of delivery and is not transferrable.

Lead Time: 9 weeks from date of order confirmation.

ITEM NO.	DESCRIPTION	UNIT PRICE (USD)
31 00 119	RespiSim® System Educational Package - PRO	$65,895.00
31 00 765	Ventilator Interface Kit Option	$5,995.00
50 10 102	Modes of Ventilation (5 modules)	$3,580.00
50 10 103	Airway Resistance and Static Compliance in CMV (4 modules)	$2,864.00
50 21 100	Non-Invasive Positive Pressure Ventilation (NIV)	$895.00
50 21 101	Patient-Ventilator Synchrony in Volume Assist-Control Mode (4 modules)	$2,864.00
50 21 104	Lung Protective Ventilation: Low Tidal Volume	$895.00
50 10 105	Understanding Modes of Mechanical Ventilation: A New Taxonomy (10 modules)	$5,817.50
50 21 107	Clinical Simulation Exam Prep (3 Modules)	$2,148.00
	PRO Package 2 year extended warranty computer/monitors are excluded from extended warranty **(total 3 years - first year included with purchase)**	$5,190.00
	Shipping via UPS Ground Service - lower 48 states (not to exceed)	$600.00

Please contact me if you have questions.
Liz Bolen X129
Account Executive
lbolen@ingmarmed.com

A purchase order is required and needs to be faxed, mailed or emailed to IngMar Medical.