# Et bilde som inneholder tegning Automatisk generert beskrivelseSanity Template for Intensive Care Unit Dyssynchrony with Ventilation

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| **Field** | **Text** |
| Title | Covid-19 Part 2: Inspiratory Dyssynchrony on Ventilator |
| Subtitle | Advanced Respiratory Care |
| Publishing Organization | Laerdal Medical |
| Overview tab |  |
| Simulation Type | Simulator based |
| Simulation time | 25 minutes |
| Debriefing time | 30-40 minutes |
| Level | Advanced |
| Patient Type | Adult |
| Target Groups | Health Care Providers in Intensive Care Unit |
| Summary | This scenario presents with a 71-years-old male with suspected Covid-19 who was admitted from the Emergency Department with Severe Acute Respiratory Infection (SARI). Over 4 hours ago he was transferred to the Intensive Care Unit in an isolation bay.  The participants are expected to assess the patients work of breathing, identify respiratory dyssynchrony, perform respiratory interventions and recognize the need for sedation to maximize the ventilation for the patient. The participants should communicate with the patient and follow isolation protocols including donning and doffing PPE for contact precaution. |
| learning objectives | *By end of simulation the participants should be able to:*   * Apply standard precautions according to presumed diagnosis including appropriate PPE * Perform a primary assessment of a patient with severe acute respiratory infection (SARI) * Improve ventilation by changing ventilator settings * Discuss concerns with team in relation to increased respiratory dyssynchrony * Provide sedation to patient * Reassess patient to evaluate the effect of treatment * Doff PPE according to procedure |
| Educational information | Ingmar medical has created a Covid-19 Knowledge Base on their website with an easy access to educational material. Here, users can apply for on-demand-webinars on running simulations with mechanical ventilation. On the link to external resources, you can access links to latest articles on Covid-19 treatment as well as videos on how to run simulation with a wide range of ventilator producers.  Find the Covid-19 Knowledge base here: <https://www.ingmarmed.com/covid19/> |
| Further readings | *Infection prevention and control during health care when*  *novel coronavirus (nCoV) infection is suspected. Interim Guidance*, World Health Organization 25 January 2020, WHO/2019-nCoV/IPC/v2020.2: <https://www.who.int/publications-detail/infection-prevention-and-control-during-health-care-when-novel-coronavirus-(ncov)-infection-is-suspected-20200125>  **I**ntensive care nurses’ perceptions of simulation-based team training for building patient safety in intensive care: A descriptive qualitative study*, In Intensive and Critical Care Nursing,*Vol. 34, issue 4, August2014, pp 179-187, attained from  <https://doi.org/10.1016/j.iccn.2014.03.002>   COVID-19 Knowledge Base on Ingmar Medical website: <https://www.ingmarmed.com/covid19/> |
| Scenario image | Pending |
| Scenario Video | NA |
| Why use this scenario? | This scenario is designed for health care providers in the Intensive Care unit to train care for a patient with Covid-19 under contact precautions. The learning objectives provide possibility to train assessment and interventions for a patient on ventilator with a high respiratory drive secondary to Covid-19. The scenario is designed according to the World Health Organization’s recommendations for treatment of Covid-19 ultimo March 2020. |
| Prepare tab |  |
| Location | Intensive Care Unit |
| Participants | * 1-2 * 1 observer * 1 instructor to run the scenario * 1 facilitator to lead the debriefing session |
| Equipment list | Medical Supplies  * ABHR - Alcohol base hand rub * Blood pressure cuff * Capnometer * ECG electrode cables * Endotracheal intubation kit * IV line * Medical face masks (N95 mask with respirator) * Multiple IV-line poles and pumps * Closed circuit ventilator (long-term) * SpO2 probe Standard precautions equipment for all participants (long-sleeved, disposable gown, goggles or face shield and non-sterile gloves) * Stethoscope * Suction line and tubing * Thermometer * Universal precautions equipment * Circuits for the ventilators * IV Therapy Running * Arterial Line * Central Venous Catheter line * Indwelling Catheter * NG Wide bore  Props  * Patient gown * Hospital bed on wheels * Multiple IV line poles and pumps * Ventilator  Medications  * Ipratropium * IV Antibiotics * Midazolam * Morphine * Normal Saline * Propofol * Suxamethonium * Vecuronium |
| Preparation and setup | * Place the simulator lying in a hospital bed * Apply moisture on upper lip and forehead to simulate sweating * Patient should be intubated, with central line, arterial line and IDC * Connect the ASL 5000 Lung Solution to the local ventilator * Label all lines at bedside |
| Role Information | NA |
| Patient chart | NA |
| Training Devices | SimMan 3G family |
| Simulation devices | Lleap |
| Simulation mode | Automatic mode |
| Additional Simulation Equipment | Patient Monitor, SpO2 probe, ALS 5000 Lung Solution |
| Simulate tab |  |
| Learner Brief | *The learner brief should be read out loud to the learners before the simulation starts.*  **Intensive Care Unit**  **21:00 Hours Handover for the Night Team (**Day zero)  **Situation:** Your Patient is Antoine Debuzzy, he is a 71-years-old male, who presented to the Emergency Department today with severe respiratory distress due to lung infection which is suspected to be Covid-19. The patient was transferred to the Intensive care unit 4 hours ago and at times has a high respiratory drive.  **Background:** The patient has a past-history of non-insulin requiring diabetes and chronic kidney disease.  **Assessment:**  Central Nervous System: Patient is awake, able to follow commands and move all limbs, PEARL 3+, moderate sedation has been instituted.  Cardiovascular: The patient is tachycardiac, hypotensive, febrile at 39 degrees, pale at peripheries, CVP at 8 mmHg, ETT 7.5 cm and sitting at 22 cm at the lips.  Ventilator settings: Mode= VC-AC, RR= 25 bpm, Vt= 340 (targeting 7 mL/kg of IBW), Flow= 40 L/min, PEEP=10 cmH2O, Trigger= flow 3.  Gastro-intestinal Tract: NGT in situ, Bowels sounds present  Renal: IDC in situ, IVT at 84 mL/hr  Skin: No pressure breaks noted, all lines secured and new today  X-ray has been taken and are ready for analysis on the patient Monitor  **Recommendation:** Please, go and see the patient and check up on the ventilation status. |
| Patient Picture | NA |
| Patient Data | Name: Antoine Debuzzy  Gender: Male  Age: 71 years  Weight: 83 kg  Height: 175 cm  Allergies: No known  Immunizations: Yearly influenza vaccine |
| Start vital signs | Initial vitals  • ECG: Sinus w occasional VES  • HR: 126 bpm  • RR: 36 rpm  • BP: 125/74mmHg  SpO2: 91%   * EtCO2: 47 mmHg   • Tblood: 39 oC |
| Medical history | **Past Medical History**  Diabetes 2, chronic kidney disease  **Resent Medical History**  Patient got a cold 3 days ago with fever, sore throat, sneezing and increasing fatigue. This morning, his son called that he had been tested positive for Covid-19, after returning from a business trip in an endemic Covid-19 area. Patient met with his son 9 days ago.  **Social History**  Retired bus driver 8 years ago, married with 2 grown-up children, smokes 4-6 cigarettes per day. Used to drink alcohol on daily basis until he got a diagnosis of diabetes type 2 seven years ago and chronic kidney disease 10 years ago. Active in the local AA society. |
| Clinical Findings | * Respiratory distress * Dry coughing with chest pain * Sweating and shivering |
| Diagnostics | X-ray Chest x-ray is available on patient monitor Laboratory **Arterial Blood Gas during simulation:**  Start of simulation before changing oxygen administration:  pH 7.28, PaCO2: 55 mmHg, PaO2: 75 mmHg, HCO3-: 22 mEq/L  During dyssynchrony with the ventilator:  pH 7.30, PaCO2: 50 mmHg, PaO2: 80 mmHg, HCO3-: 22 mEq/L  After increased sedation:  pH 7.23, PaCO2: 60 mmHg, PaO2: 65 mmHg, HCO3-: 22 mEq/L |
| Provider’s orders |  |
| Expected interventions | * Assemble and prepare equipment * Don PPE according to procedure and IPC guidelines for acute respiratory infections (ARI) * Identify patient * Perform primary survey including oxygen therapy * Assess infusion of normal saline * Inform patient in relation to plan of care * Communicate effectively with interprofessional team * Improve ventilation support with ventilation strategies * Recognize the need for potential sedation * Discuss the change in patient condition with Intensive Care Unit provider * Increase sedation to the patient * Safely dispose of equipment * Doff PPE according to procedure |
| Assessment Instruments | This scenario contains scoring that enables a summative assessment of the participants. The scoring is based on key events which should be logged during simulation. The scoring is presented in a separate score card in the Session Viewer under the Performance tab. |
| Operator Information (presented in accordions on Scenario Cloud) | Running Simulation with ASL 5000 Lung Solution This scenario requires an additional plugin to LLEAP to run correctly. Please, find a guide for installing the plugin to LLEAP below:  (Add attachment) Information on logging PPE This simulation is a team training session. All participants are required to apply adequate PPE. If one of the participants fails to apply one of the required PPE equipment items, this item should not be logged even though the rest of the participants apply the PPE equipment item. It is a basic assumption that the team helps and ensures that all participants have don correct PPE after procedure. |
| Scenario Progression Image | NA |
| Scenario Progression Image Title | NA |
| Scenario Progression Image Description | NA |
| Scenario Progression Attachment | NA |
| Debrief tab |  |
| Guided reflection questions | These guided reflection questions are organized by the gather-analyze-summarize (GAS) method. The questions are presented to suggest topics that may inspire the debriefing conversation. Gather Information  * What are your reactions to this simulation? What are your other initial reactions? * Would one of you describe the events from your perspective? * From your perspective, what were the main issues you had to deal with?  Analyze  * Describe the characteristics of vital signs for respiratory virus infections. Which characteristics was applicable in this case? * Describe how the patient was ventilating at the start of the simulation? * Describe what steps you did to improve ventilation? * What were your considerations concerning increasing sedation? * How was your cooperation within the team and with the patient? * Which interprofessional communication did you perform? * How did you ensure safety precautions before, during and after the patient encounter?  Summarize  * What are the key points from this simulation? * What would you like to do differently next time in a similar situation? * What are your main take-home messages? |
| Guided reflection Attachment | NA |
| Case considerations | The team should apply routine IPC (i.e. standard precautions) for all patients. Moreover, it is of outmost importance to apply standard precautions at all times including but not restricted to:  • Hand hygiene  • Respiratory hygiene  • PPE according to the risk  • Safe injection practices, sharps management and injury prevention  • Safe handling, cleaning and disinfection of patient care equipment  • Environmental cleaning  In this case, the participants should manage mechanical ventilation for the critically unwell patient. Staff with advanced ventilation skills will have the opportunity to practice their ventilation techniques in treatment of Covid-19. |
| Case considerations image | NA |
| Case considerations image Descriptions | NA |
| Case considerations Attachment | NA |
| Files and attachments |  |
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| Co-developer One | Ingmar Medical |
| Co-developer Two | NA |
| Legal Notice | NA |
| Credits | Contribution and review by Ingmar Medical Jessica Dietz, MS, RRT-ACCS  Clinical Educator  Justina Gerard, MBA, RRT  Clinical Educator  Acknowledgement  **Peter Xu, RT**  Sir Run Run Shaw Hospital, the affiliated hospital of Zhejiang Medical university, Wubei, China X-ray Source Case courtesy of Dr Derek Smith, Radiopaedia.org. From the case rID: 75251 |
| Scenario Settings |  |
| Training disciplines | |  | | --- | | x  Community Health and Public Safety | | ​​☐​  EMS /Prehospital | | x  Interdisciplinary | | x  Medical | | ​​X​  Military | | x  Nursing | | ​​☐​  Nursing Aids | | ​​☐​  Occupational Therapy | | ​​☐​  Phlebotomy | | ​​☐​  Pharmacy | | x  Physician Assistant | | ​​☐​  Radiology Technician | | ☐  Respiratory Therapy | |
| Education level | |  | | --- | | ☐ Undergraduate | | X Postgraduate | |
| Medical specialities | |  | | --- | | ☐  Allergy and immunology | | ​​☐​  Anesthesiology | | ​​☐​  Cardiology | | x  Critical Care Medicine | | ​​☐​  Dermatology | | Emergency Medicine | | ​​☐​  Endocrinology | | ​​☐​  Family Medicine | | ​​☐​  Gastroenterology | | ​​☐​  Geriatrics | | x  Hospital Medicine | | x  Infectious diseases | | ​​☐​  Internal medicine | | ​​☐​  Nephrology | | ​​☐​  Neurology | | ​​☐​  Neurosurgery | | ​​☐​  Obstetrics and Gynecology | | ​​☐​  Oncology | | ​​☐​  Ophthalmology | | ​​☐​  Orthopedics | | ​​☐​  Otolaryngology | | ​​☐​  Palliative care | | ​​☐​  Pediatrics | | ​​☐​  Pharmacology | | ​​☐​  Psychiatry | | x  Pulmonology | | ☐Radiology | | ​​☐​  Rehabilitation Medicine | | ​​☐​  Rheumatology | | ​​☐​  Surgery | | ​​☐​  Vascular surgery | |
| Nursing specialities | |  | | --- | | ​​☐​  Ambulatory care nursing | | ​​☐​  Advanced practice nursing | | ​​☐​  Burn nursing | | ​​☐​  Cardiac nursing | | ​​☐​  Diabetes nursing | | ​​☐​  Medical case management | | ​​☐​  Community health nursing | | x  Critical care nursing | | Emergency nursing | | ​​☐​  Gastroenterology nursing | | ​​☐​  Geriatric nursing | | ​​☐​  Home health nursing | | ​​☐​  Hospice and palliative care nursing | | ​​☐​  Hyperbaric nursing | | ​​☐​  Immunology and allergy nursing | | ​​☐​  Intravenous therapy nursing | | X Infection control nursing | | x Infectious disease nursing | | ​​☐​  Maternal-child nursing | | ​​☐​  Medical-surgical nursing | | ​​☐​  Military and uniformed services nursing | | ​​☐​  Neonatal nursing | | ​​☐​  Neurosurgical nursing | | ​​☐​  Nephrology nursing | | ​​☐​  Nurse midwifery | | ​​☐​  Obstetrical nursing | | ​​☐​  Oncology nursing | | ​​☐​  Orthopedic nursing | | ​​☐​  Ostomy nursing | | ​​☐​  Pediatric nursing | | ​​☐​  Peri anesthesia nursing | | ​​☐​  Perioperative nursing | | ​​☐​  Psychiatric nursing | | x Pulmonary nursing | | ​​☐​  Radiology nursing | | ​​☐​  Rehabilitation nursing | | ​​☐​  Renal nursing | | ​​☐​  Sub-acute nursing | | ​​☐​  Substance abuse nursing | | ​​☐​  Surgical nursing | | ​​☐​  Urology nursing | | ☐ Vascular access | | ☐  Wound care | |
| Nursing courses | |  | | --- | | ☐  Child & adolescent health | | ​​☐​  Community and family health nursing | | ​​☐​  Fundamentals of nursing | | ​​☐​  Gerontology | | ​​☐​  Health assessment | | ​​☐​  Leadership | | ​​☐​  Maternal-neonatal health | | x  Medical-surgical nursing | | ​​☐​  Pathophysiology | | ​​☐​  Pharmacology | | ​​☐​  Psychiatric and mental health | |
| Body systems | x  Circulatory  ☐  Digestive  ☐  Endocrine  ☐  Hematopoietic  ☐  Immune/lymphatic  ☐  Integumentary  ☐  Muscular  ☐  Nervous  ☐  Renal/Urinary  ☐  Reproductive  x  Respiratory  ☐  Skeletal |
| Assessment type (summative/formative) | |  | | --- | | x  Formative | | Summative | |
| Free for public use | YES |