COVID-19

What Maternity and Neonatal Care Providers Are Learning

April 17, 2020
12 – 1 pm EST

Ohio Perinatal Quality Collaborative

Through collaborative use of improvement science methods, reduce preterm births & improve perinatal and preterm newborn outcomes in Ohio as quickly as possible.
Today’s presenters:

William Schnettler, MD
Tri-Health
Maternal Fetal Medicine

Anju Suhag, MD
Tri-Health
Maternal Fetal Medicine

Renee Napier MSN, CNP, NNP-BC
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Hospital Medical Center

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Hospital Medical Center

Heather Lortz, BSN, RNC-OB
OSU Wexner
Medical Center
Welcome

• Goals:
  • Share practicalities of implementing strategies now
  • Discuss what people are doing in situations where it is unclear and guidance doesn’t exist
  • ALL TEACH ~ ALL LEARN

• Over 236 registrants with several submitted questions. The focus of today’s webinar is:
  • Case study of a critically ill COVID-19+ pregnant patient and her infant
  • The benefit of a debrief and simulation in COVID-19 settings

• Plans:
  • The slide deck and recording of this webinar will be posted on the OPQC website
  • We will provide shared resource links on the website and update regularly

• The case scenarios are from individual institution responses, not OPQC recommendation

Updated on April 17, 2020
Options for Participating in COVID-19 Neonatal Registries

Updated on April 17, 2020

• AAP Section on Neonatal Perinatal Medicine (SONPM) Registry
  • National Registry for Surveillance and Epidemiology of Perinatal COVID-19 Infection
  • Data for maternal/infant dyads for which the mother has confirmed COVID-19 disease
  • 44 hospitals registered and submitting data + 38 in process + 20 interested

102 hospitals (3 in Ohio)

• See link at end of slide deck to sign up! Mark Hudak (SONPM President) is happy to talk to anyone by phone or email about this opportunity if you have questions (mark.hudak@jax.ufl.edu)
VON and the AAP Section on Neonatal Perinatal Medicine (SONPM) created a tool to help newborn care teams understand the impact of COVID-19 in their own units and more broadly in the neonatal community. The goal is to inform local and national decision-making for program evaluation and quality improvement.

The VON SONPM COVID-19 Impact Audit is open to all hospitals caring for infants (regardless of VON membership).

The audit will be conducted on a single day of your choice and you may choose to repeat the audit each month (one response per hospital per month).

Aggregate reporting will be publicly available on the VON website in early May, potential for state report if enough sites participate.

See link at end of slide deck to sign up!
Participating in COVID-19 Obstetrical Registry

- https://priority.ucsf.edu/

**PRIORiTY Study**

PRIORiTY (Pregnancy CoRonavirus Outcomes Registry) is a nationwide study of pregnant or recently pregnant women who are either under investigation for Coronavirus infection (COVID-19) or have been confirmed to have COVID-19. This study is being done to help patients and doctors better understand how COVID-19 impacts pregnant women and their newborns.

**Study overview**

- **Research Topic**: Pregnancy and Coronavirus (COVID-19)
- **Location**: Online
- **Compensation**: Up to $40 in gift cards

**TOTAL ENROLLED: 300 (Updated 4/16/2020)**

**What is the purpose of this study?**

The goal of the study is to better understand how pregnant women are affected by COVID-19 including what their symptoms are, how long they last, and how COVID-19 may impact their pregnancy and/or delivery.
## Data Update April 16, 2020

### WHO/CDC/ODH: COVID-19 Outbreak

|-----|-------------------------------------------------------------------------------------------------------------|

Updated: 16 April 2020

Coronavirus (COVID-19) outbreak

- **2,134,465** Confirmed cases
- **142,148** Confirmed deaths
- **213** Countries, areas or territories with cases

- **Total cases:** 632,548
- **Total deaths:** 27,012
- **Jurisdictions reporting cases:** 55

(50 states, District of Columbia, Puerto Rico, Guam, the Northern Mariana Islands, and the U.S. Virgin Islands)

8,414 Confirmed Cases in Ohio

- 707 ICU admissions
- 2331 Hospitalizations in Ohio
- 389 Deaths

### State of Ohio | COVID - 19 Dashboard

**Cases**

- **8,414**

Updated on April 17, 2020
Approximately how many confirmed/likely cases of COVID-19 have you had in OB patients?

- 0: 70%
- 1 to 5: 60%
- 6 to 10: 10%
- >10: 0%

Legend:
- 4/3 Webinar
- 4/10 Webinar
- 4/17 Webinar
Approximately how many newborns have you tested for COVID-19?

- 4/3 Webinar
- 4/10 Webinar
- 4/17 Webinar
Approximately how many OB patients do you have, or have you had, in the ICU with presumed or diagnosed COVID-19?
COVID-19 Critical Care OB Case

Severe ARDS in COVID-19-infected pregnancy: obstetric and intensive care considerations

William T. Schnettler MD 1, 2, 3, Yousef Al Ahwel MD 3, Anju Suhag MD 1

Abstract
Since the emergence of a novel coronavirus (SARS-CoV-2) in Wuhan, China, at the end of December 2019, its infection – COVID-19 – has been associated with severe morbidity and mortality and has left world governments, healthcare systems and providers caring for vulnerable populations, such as pregnant women, wrestling with the optimal management strategy. Unique physiologic and ethical considerations negate a one-size-fits-all approach to the care of critically ill pregnant women with COVID-19, and few resources exist to guide the multi-disciplinary team through decisions regarding optimal maternal-fetal surveillance, intensive care procedures, and delivery timing. We present a case of rapid clinical decompensation and development of severe Acute Respiratory Distress Syndrome (ARDS) in a woman at 31 weeks’ gestation to highlight these unique considerations and present an algorithmic approach to the disease’s diagnosis and management.

Keywords
COVID-19, SARS-CoV-2, pregnancy, ARDS, coronavirus, pneumonia, acute respiratory distress syndrome

https://doi.org/10.1016/j.ajogmf.2020.100120
### Case Summary

**39 yo G6P2031 at 30 6/7 weeks w/underlying myotonic dystrophy & BAV**
- 4 days of worsening SOB, cough → SpO₂ 93-94% on 4 L O₂ NC, HR 90s, RR 30s, MAP 75 mmHg
- CXray, CTPA, lung US, labs – consistent with COVID-19 but RT-PCR pending
- Rapid decompensation to SpO₂ 78%, minimal improvement w/non-rebreather → intubation / mechanical ventilation

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### Table: Readiness, Recognition, Response, Reporting

<table>
<thead>
<tr>
<th>READINESS</th>
<th>RECOGNITION</th>
<th>RESPONSE</th>
<th>REPORTING</th>
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</table>
| • Pre-Hospital  
  - Awareness  
  - Testing  
  - Transport  
  - Therapies | • Presentation  
  - Signs Symptoms  
  - Physiologic considerations | • Bed Placement  
  - Nurse / patient  
  - Capabilities  
  - Isolation | • Internal  
  - Debrief  
  - Iris reporting  
  - QA |
| • Hospital  
  - Staffing  
  - Bed space  
  - Equipment  
  - PPE  
  - Preparedness / simulation | • Work-up  
  - Labs  
  - Imaging  
  - Ancillary teams  
  - Point people / champions | • Multi-disciplinary  
  - Communication  
  - Huddles  
  - Assign “Captain”  
  - Delivery preparedness & decision tree | • External  
  - Regional HD  
  - State ODH  
  - National - CDC, SMFM registry |

<table>
<thead>
<tr>
<th>Logistics</th>
<th>Treatment</th>
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</table>
| • Timely triage  
  • Timely dispo  
  • Communication  
  • Minimizing exposure | • Medications  
  • Ventilation/Oxy  
  • Positioning  
  • Surveillance  
  • Family / support  
  • Care for self |

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*Updated on April 17, 2020*
<table>
<thead>
<tr>
<th>Critical Care Goals</th>
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</table>
| **MAP** > 65 mmHg | - First assess if fluid responsive with passive leg raise or bolus LR 500 mL to see if MAP rises > 65 mmHg  
- Start norepinephrine @ 5 mcg/min (up-titrated to 10 mcg/min) for MAP < 65 mmHg  
- Ensure CEFM if GA > 24 weeks |
| **SpO₂ > 94%** | - Increase PEEP to 10-24 cm H₂O  
- Consider VC+ modality  
- Consider prone positioning  
- Ensure finger is warm or place monitor on forehead |
| **PaO₂ > 80 mmHg** | - Increase PEEP to 10-24 cm H₂O  
- Increase I:E ratio  
- Consider prone positioning |
| **PaCO₂ < 40 mmHg** | - Increase ventilatory / respiratory rate to 20-25 bpm  
- Consider higher tidal volume than 6 ml/kg ideal body weight  
- Ensure no “auto-PEEP” – keep plateau pressure < 25 cmH₂O |
| **pH 7.3-7.5** | - First assess if acidemic or alkaline  
- Then assess which is more out-of-range (PO₂ or PCO₂)  
- If metabolic acidosis, assess anion gap & ensure appropriate ventilatory compensation (Bicarb x 1.5) + 8 = PO₂ |
| **Bicarb 18-22 mmHg** | - Consider addition of IV bicarb if low AND pH < 7.1 |
| **Anion Gap 6-15** | - Correct for hypoaalbuminemia (add 2.5 to gap for every 1 g/dl albumin below level of 2.5 g/dl) |
| **PiP < 35 mmHg** | - Check peak inspiratory pressure on vent & ensure < 40 cm H₂O  
- Consider VC+ modality |
| **UOP > 20 ml/kg/hr** | - Place Foley catheter and ensure strict 1st/2nd daily weights |
| **Skin** No break-down | - Evaluate skin front & back daily (esp under fetal monitors) |
| **VTE Prophylaxis** | - Consider Institution of Heparin 7,500 U BID in 2nd trimester & 10,000 U BID in 3rd trimester if delivery is not imminent |
| **Papic Ulcer Prophylaxis** | - Consider H2 blockade |
| **CEFMI** Category 1-2 | - Delivery for category 3 if GA > 28 weeks  
- Worsening category 2 may signal worsening maternal status |
| **Sedation** Lowest achievable | - Goal is to achieve RASS of 0 (alert & calm) while on mechanical ventilation  
- May need to increase sedation with propofol, fentanyl, midazolam  
- May need paralytic (cisatracurium) esp when proneing |
## Delivery Considerations

<table>
<thead>
<tr>
<th>GA &lt; 24 weeks</th>
<th>Non-Critically Ill</th>
<th>Critical Ill</th>
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<tbody>
<tr>
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<td>If preivable PTL – can deliver in COVID unit or LDR</td>
<td>Avoid delivery in an UNSTABLE mother</td>
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<td>If preivable PTL – deliver in ICU, main OR if D&amp;C required</td>
<td>If preivable PTL – deliver in ICU, main OR if D&amp;C required</td>
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<table>
<thead>
<tr>
<th>GA 24-34 weeks</th>
<th>Severe but Non-Critically Ill</th>
<th>Critical Ill</th>
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<tbody>
<tr>
<td></td>
<td>Attempt to delay delivery and stabilize treat mother</td>
<td>Avoid delivery in UNSTABLE mother</td>
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<td>Betamethasone if imminent delivery within a week</td>
<td>Attempt to delay delivery &amp; stabilize / treat mother</td>
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<td>MgSO4 for fetal neuroprotection if GA &lt; 32 weeks (if benefits outweigh risk of pulmonary edema)</td>
<td>Case by case determination of delivery for maternal or fetal benefit if stable mother</td>
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<td>Consider delivery for NRFT1's (category 3 or persistent category 2 fetal tracing) if stable mother</td>
<td>Betamethasone ONLY IF HIGH risk for imminent delivery within a week</td>
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<td>Imminent need for SVD – move to LDR</td>
<td>MgSO4 for fetal neuroprotection if GA &lt; 32 weeks (if benefits outweigh risk of pulmonary edema)</td>
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<td>Imminent need for C/section – move to L&amp;D OR</td>
<td>Imminent need for SVD – deliver in ICU</td>
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<table>
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<tr>
<th>GA ≥ 34 weeks</th>
<th>Severe but Non-Critically Ill</th>
<th>Critical Ill</th>
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<td></td>
<td>Attempt to delay delivery and stabilize / treat mother</td>
<td>Avoid delivery in UNSTABLE mother</td>
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| GA ≥ 34 weeks | Critical Ill | |
|---------------|--------------| |
|                | Avoid delivery in UNSTABLE mother | Avoid delivery in UNSTABLE mother |
|                | Case by case determination of delivery for maternal or fetal benefit if stable mother | Case by case determination of delivery for maternal or fetal benefit if stable mother |
|                | Avoid late preterm betamethasone | Avoid late preterm betamethasone |
|                | Imminent need for SVD – deliver in ICU | Imminent need for SVD – deliver in ICU |
|                | Imminent need for C/section – move to L&D OR | Imminent need for C/section – move to L&D OR |
|                | Perimortem c/section – proceed in ICU | Perimortem c/section – proceed in ICU |
## COVID-19 Critical Care OB Case

### Timeline

<table>
<thead>
<tr>
<th>Days after illness onset</th>
<th>Fever</th>
<th>Cough</th>
<th>Dyspnea</th>
<th>Severe ARDS/ICU admission</th>
<th>Invasive ventilation</th>
<th>Hydroxychloroquine</th>
<th>Remdesivir</th>
<th>RT-PCR returned positive</th>
<th>Delivery</th>
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Transition: OB to NICU

- Multidisciplinary pre-brief huddle: OB, Anesthesia, RT, RN, NICU, OR
- NICU specific pre-brief huddle: APRN (1), NICU Fellow (1), RN (3), RT (1)
- Role assignment
- Planned process

NICU Approach:

- 2-tiered structure adapted from University of Washington algorithm
- Limit number of people exposed to Mother
  - 1 NICU member in delivery versus OB RN to bring infant to resuscitation room (anteroom between maternal OR and infant resuscitation OR)
- Limit number of people immediately exposed to infant
  - Resuscitation room in adjoining OR with Provider and RT (full PPE)
  - Remainder of NICU staff outside Resuscitation Room if needed (limits PPE and exposures)
NICU Resuscitation, Transfer and Care of Premature Infant Born to COVID+ Mother

Transfer to NICU from Resuscitation OR:
• Infant placed in isolette covered in plastic for transport (limit aerosolization with double-wall isolette and plastic)
• Admitting RN (full PPE) only one to have direct touch on infant during transport
• Use patient elevators and bring through back door of NICU (limit transport throughout NICU)
• RT and NICU RN only in room for admission

Care in NICU:
• Admit into reverse airflow room
• Contact and Droplet precautions until 2 negative tests 24 hours apart
• Bathe infant immediately
• Use baby monitors for communication of needs to outside of room
• 1:1 nursing care

Renee Napier MSN, CNP, NNP-BC
Neonatal Nurse Practitioner
Neonatal Intensive Care, Cincinnati Children's Hospital and Tri-health

Updated on April 17, 2020
NICU Visitation and Communication

Updated on April 17, 2020

- **Father not permitted to visit for 14 days from last contact with Mom:**
  - Father symptomatic prior to Mom
  - Tested on Day 14
  - Allowed to visit after 14 days with test results pending – resulted negative

- **Communication with Dad:**
  - Updates by both physician/NNP and nursing team providers
  - Video communication with phone
  - With consent, pictures of infant sent to Dad electronically

- **Communication with Mom:**
  - Limited due to Mom’s condition
  - Pictures of infant printed/laminated and placed in Mom’s ICU room
Current COVID Visitation Policy for the NICU

• General NICU visitation during COVID restricted to 2 bracelet holders

• No visitor with confirmed or suspected COVID-19, or close contact to confirmed/suspected, shall be permitted to enter the NICU

• Asymptomatic partner may visit 14 days after last exposure to positive Mother

• Mother with COVID-19 and symptomatic household partner can not visit until:
  • Resolution of fever without antipyretics for 72 hours AND
  • Improvement (but not full resolution) in respiratory symptoms AND THEN
  • Two consecutively negative COVID-19 nasopharyngeal tests collected >24 hours apart

Based on CCHMC Perinatal Institute Care Guidelines

Jennifer Brady, MD
Associate Medical Director, Good Samaritan NICU
Perinatal Institute- Cincinnati Children’s Hospital Medical Center

Updated on April 17, 2020
Communication Goals for when NICU Visitation is not Possible due to COVID-19

• Nursing updates to parents every 3-6 hours

• Video connection between parents and infant every 6 hours

• Provider daily update to parents via phone or video chat

• Daily photo of infant provided to parents, either print or digital

Based on CCHMC Perinatal Institute Care Guidelines
The need for debriefing after an event like this...

Updated on April 17, 2020

Registration question results:

Has your site conducted any simulations \textit{specific to care of the COVID-19+} pregnant patient and/or her infant?

Please type into the chat box an unexpected learning from a recent simulation or debrief
Simulation in Obstetric Procedures: COVID-19+

Heather Lortz, BSN, RNC-OB, C-EFM
Perinatal Safety Nurse
OSU Wexner Medical Center
April 17, 2020
Simulation in Obstetric Procedures: COVID-19+

Updated on April 17, 2020

Why Simulation in Obstetrics?

Guidelines for Perinatal Care: 8th Edition
- “The principle that standardization of care can improve patient outcomes applies to emergencies as well as to routine care.”
- “Simulation should include the following components: standardized procedures, effective communication among team members, and nonhierarchical teamwork.”
- “Drills and simulations may use a sophisticated simulated environment, but also can use the everyday workspace for a mock event.”

Quality Patient Care in Labor and Delivery: A Call to Action (JOGNN, 2012)
- Structured systems may help to optimize communication about and response to rapid changes in patient status.
  - Drills and simulations
  - Debriefing and case reviews
Simulation of Suspected COVID-19 Cesarean

Stakeholders

• Nursing and Physician/Resident Leadership
• Anesthesia
• NICU Team Leadership
• Postpartum/Well-baby Nursery

Scenario

• Patient presents for a scheduled repeat cesarean delivery
• Upon registration screening the patient reports symptoms concerning for COVID-19
• Activate the model for COVID C-S
COVID-19: Cesarean Section Algorithm

**Preoperative**
- **L&D staff notified (Charge RN)**
  - Charge RN notifies RN1, NICU Charge RN, OB Team, Anesthesia, Postpartum
- **RN1 Prep patient in L&D room**
  - (preferred rooms: 629, 610, 630, 634, 640)
- **RN1 Phone Consult**
  - OB Team
  - NICU Team
  - Anesthesia
- **RN1 to transport patient to OR**
  - when ready, runner to assist with transport if needed
- **RN1 hands off to RN2 and RN3 at OR doors**
- **RN2/RN3 move patient OR bed and transfer patient back to RN1**
- **RN1 to clean L&D bed; Bed to remain in**

**Sterile Scrub Area:**
- Scrub tech dons PPE, scrubs and assures instruments / equipment
- Anesthesia dons PPE prior to entering OR
- OB Team dons PPE and scrubs prior to entering OR
- NICU Team dons PPE to enter OR; assures OR ready with isolette in hallway for transport

**Intraoperative**
- Designated runner available outside room for labs, etc.
- RN2: Circ OR Nurse
- RN1: Baby Nurse
- Anesthesia performs assessment / consent
- Case with OB Team
- Phase One Recovery in OR
- RN/Scrub Tech assists OB Team and NICU Team dress gloves /gloves in OR
- OB team exists OR
- Neonate exits OR by placing in isolette outside OR door
- Neonate transported to room / nursery / NICU as deemed necessary
- RN and Anesthesia move patient from OR bed to L&D bed and transport to L&D room for recovery
  - (Preferred 629, 610, 634 – should not recover in recovery room)

**Postoperative / PACU**
- RN1 dons PPE and receives patient from RN2 and Anesthesia
- Specimen Handling:
  1. Label and place in bag → wipe bag with #1 sani wipe
  2. Hand off to nurse (with gloves and wipe) →
  3. Wipe bag with new sani wipe and place in bag #2
- PPE in L&D rooms: gown, gloves, mask, face shield, cap
- PPE in OR: N95 mask, gown, gloves, face shield, cap

*Updated 4/7/2020*

*NOTE: OB, Anesthesia, NICU team members will be assigned by service attending as deemed clinically indicated. Protocol should be adapted to your specific situation. Use clinical judgement as needed.*
Simulation in Obstetric Procedures: COVID-19+

Updated on April 17, 2020

Debrief & Lessons Learned

Barriers
- Disagreement/Opinions
- Staffing/Time Concerns
- Resident Rotation

Lessons Learned
- Practice routine cases, not STAT scenarios
- **No waste of PPE**
- No sterile equipment opened
- Review information frequently in huddles

- **Celebrate Success!!**
  - Information is Power
  - Laughter is good medicine
  - Excellent team building
Simulation in Obstetric Procedures: COVID-19+

https://doi.org/10.1055/s-0040-1709683

Updated on April 17, 2020

Operating Room Guide for Confirmed or Suspected COVID-19 Pregnant Patients Requiring Cesarean Delivery

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Abstract

We sought to provide a clinical practice protocol for our labor and delivery (L&D) unit, to care for confirmed or suspected COVID-19 patients requiring cesarean delivery. A multidisciplinary team approach guidance was designed to simplify and streamline the flow and care of patient with confirmed or suspected COVID-19 requiring cesarean delivery. A protocol was designed to improve staff readiness, minimize risks, and streamline care processes. This is a suggested protocol which may not be applicable to all healthcare settings but can be adapted to local resources and limitations of individual L&D units. Guidance and information are changing rapidly; therefore, we recommend continuing to update the protocol as needed.

Keywords
- coronavirus
- cesarean delivery
- COVID-19
- team-based care
- protocol

Key Points
- Cesarean delivery for confirmed or suspected novel coronavirus disease 2019 (COVID-19) patients
- Team-based approach for streamlined care
- Labor and delivery protocols for COVID-19 positive patients
References


COVID-19 - What Maternity and Neonatal Care Providers Are Learning
Friday, April 24th 12N-1pm

**Goal:** Investigate the impact of racial disparities for the pregnant patient during the COVID-19 pandemic and supportive measures for caregivers
Contact information for today’s presenters

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Updated on April 17, 2020
• Vermont Oxford Network (VON) Audit
  • https://public.vtoxford.org/covid-19/

• AAP Section on Neonatal Perinatal Medicine (SONPM) Registry
  • https://services.aap.org/en/community/aap-sections/sonpm/

• PRIORITY (Pregnancy Coronavirus Outcomes Registry)
  • https://priority.ucsf.edu/
The OPQC website has a list of information and resources that will be updated regularly: https://opqc.net/

Contact us: info@opqc.net
Take care out there
It takes a village...

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