

# Airway Measures

MEASURE SPECIFICATIONS

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## Airway-20: First Pass Invasive Airway Success

**Measure Score Interpretation:** For this measure, a higher score indicates better quality.

Measure Description	
<p>Percentage of invasive airway procedures on EMS responses originating from a 911 request for:</p> <ol style="list-style-type: none"> <li>1. Patients less than 18 years of age who receive a successful invasive airway placement on first attempt,</li> <li>2. Patients less than 18 years of age who receive a successful endotracheal intubation placement on first attempt.</li> <li>3. Patients less than 18 years of age who receive a successful supraglottic airway placement on first attempt.</li> <li>4. Patients greater than or equal to 18 years of age who receive a successful invasive airway placement on first attempt.</li> <li>5. Patients greater than or equal to 18 years of age who receive a successful endotracheal intubation placement first attempt.</li> <li>6. Patients greater than or equal to 18 years of age who receive a successful supraglottic airway placement on first attempt.</li> </ol>	
Measure Components	
<b>Initial Population</b>	All initial (first) invasive airway attempts for patients in EMS responses originating from a 911 request
<b>Initial Population Pseudocode</b>	<p style="text-align: center;"><b>NEMESIS</b></p> <pre>( eProcedures.ProcedureGroup where (     first (<a href="#">eProcedures.03 Procedure</a> is in     (         683005 Indirect laryngoscopy (procedure),         49077009 Flexible fiberoptic laryngoscopy (procedure),         78121007 Direct laryngoscopy (procedure),         112798008 Insertion of endotracheal tube (procedure),         16883004 Endotracheal intubation, emergency procedure         (procedure),         182682004 Emergency laryngeal intubation (procedure),         232674004 Orotracheal intubation (procedure),         232677006 Tracheal intubation using rigid bronchoscope         (procedure),         232678001 Orotracheal fiberoptic intubation (procedure),         2326700089 Nasotracheal intubation (procedure),         232682004 Nasotracheal fiberoptic intubation (procedure),         232680007 Nasal intubation awake (procedure),         241689008 Intubation, Rapid Sequence Intubation (RSI)         (procedure),         304341005 Awake intubation (procedure),         397892004 Retrograde intubation (procedure),         418613003 Tracheal intubation through a laryngeal mask airway         (procedure),</pre>

	<p>429705000 Intubation, combitube (procedure),  424979004 Laryngeal mask airway insertion (procedure),  427753009 Insertion of esophageal tracheal double lumen supraglottic airway (procedure),  429161001 Insertion of endotracheal tube using laryngoscope (procedure),  450601000124103 Intubation, orotracheal (procedure),  450611000124100 Insertion of Single Lumen Supraglottic Airway Device (procedure),  1141752008 Flexible video intubation laryngoscope (physical object),  285696003 Fiberoptic laryngoscope (physical object),  420311007 Flexible fiberoptic laryngoscope (physical object),  421100004 Rigid fiberoptic laryngoscope (physical object),  44738004 Laryngoscope device (physical object),  469919007 Flexible video laryngoscope (physical object),  70065001 Rigid intubation laryngoscope (physical object),  701054002 Flexible fiberoptic intubation laryngoscope (physical object),  706013009 Intubation laryngoscope (physical object),  734928009 Rigid non-bladed video intubation laryngoscope (physical object),  879788006 Channeled video intubation laryngoscope (physical object))</p> <p>and</p> <p><a href="#">eProcedures.01 Date/Time Procedure Performed</a> is not in  ( Null,  7701001 (“Not Applicable”),  7701003 (“Not Recorded”))</p> <p>and</p> <p><a href="#">eProcedures.02 Procedure Performed Prior to this Unit’s EMS Care</a> is not 9923003 (“Yes”))</p> <p>and</p> <p><a href="#">eResponse.05 Type of Service Requested</a> is in  ( 2205001 (“Emergency Response (Primary Response Area)”),  2205003 (“Emergency Response (Intercept)”),  2205009 (“Emergency Response (Mutual Aid)”))</p>
<b>Denominator Statement</b>	<p><b>Population 1:</b>  First attempted invasive airway procedures from EMS responses in the initial population for patients less than 18 years of age</p>

	<p><b>Population 2:</b> First attempted endotracheal intubation procedures from EMS responses in the initial population for patients less than 18 years of age</p> <p><b>Population 3:</b> First attempted supraglottic airway procedures from EMS responses in the initial population for patients less than 18 years of age</p> <p><b>Population 4:</b> First attempted invasive airway procedures from EMS responses in the initial population for patients greater than or equal to 18 years of age</p> <p><b>Population 5:</b> First attempted endotracheal intubation procedures from EMS responses in the initial population for patients greater than or equal to 18 years of age</p> <p><b>Population 6:</b> First attempted supraglottic airway procedures from EMS responses in the initial population for patients greater than or equal to 18 years of age</p>
<p><b>Denominator Pseudocode</b></p>	<p style="text-align: center;"><b>NEMESIS</b></p> <p><b>Population 1:</b></p> <p style="padding-left: 40px;">Initial Population</p> <p>and</p> <p>((</p> <p style="padding-left: 40px;"><a href="#">ePatient.15 Age</a> is less than 18</p> <p>and</p> <p style="padding-left: 40px;"><a href="#">ePatient.16 Age Units</a> is 2516009 (“Years”))</p> <p>or (</p> <p style="padding-left: 40px;"><a href="#">ePatient.15 Age</a> is less than or equal to 120</p> <p>and</p> <p style="padding-left: 40px;"><a href="#">ePatient.16 Age Units</a> is in</p> <p style="padding-left: 80px;">(</p> <p style="padding-left: 120px;">2516001 (“Days”),</p> <p style="padding-left: 120px;">2516003 (“Hours”),</p> <p style="padding-left: 120px;">2516005 (“Minutes”),</p> <p style="padding-left: 120px;">2516007 (“Months”))))</p> <p><b>Population 2:</b></p> <p style="padding-left: 40px;">Initial Population</p> <p>and</p> <p>((</p> <p style="padding-left: 40px;"><a href="#">ePatient.15 Age</a> is less than 18</p> <p>and</p>

	<p><a href="#">ePatient.16 Age Units</a> is 2516009 (“Years”))</p> <p>or (</p> <p><a href="#">ePatient.15 Age</a> is less than or equal to 120</p> <p>and</p> <p><a href="#">ePatient.16 Age Units</a> is in</p> <p>(</p> <p>2516001 (“Days”),</p> <p>2516003 (“Hours”),</p> <p>2516005 (“Minutes”),</p> <p>2516007 (“Months”))))</p> <p>and</p> <p><a href="#">eProcedures.03 Procedure</a> is in</p> <p>(</p> <p>683005 Indirect laryngoscopy (procedure),</p> <p>49077009 Flexible fiberoptic laryngoscopy (procedure),</p> <p>78121007 Direct laryngoscopy (procedure),</p> <p>112798008 Insertion of endotracheal tube (procedure),</p> <p>16883004 Endotracheal intubation, emergency procedure (procedure),</p> <p>182682004 Emergency laryngeal intubation (procedure),</p> <p>232674004 Orotracheal intubation (procedure),</p> <p>232677006 Tracheal intubation using rigid bronchoscope (procedure),</p> <p>232678001 Orotracheal fiberoptic intubation (procedure),</p> <p>2326700089 Nasotracheal intubation (procedure),</p> <p>232682004 Nasotracheal fiberoptic intubation (procedure),</p> <p>232680007 Nasal intubation awake (procedure),</p> <p>241689008 Intubation, Rapid Sequence Intubation (RSI) (procedure),</p> <p>304341005 Awake intubation (procedure),</p> <p>397892004 Retrograde intubation (procedure),</p> <p>418613003 Tracheal intubation through a laryngeal mask airway (procedure),</p> <p>429161001 Insertion of endotracheal tube using laryngoscope (procedure),</p> <p>450601000124103 Intubation, orotracheal (procedure),</p> <p>1141752008 Flexible video intubation laryngoscope (physical object),</p> <p>285696003 Fiberoptic laryngoscope (physical object),</p> <p>420311007 Flexible fiberoptic laryngoscope (physical object),</p> <p>421100004 Rigid fiberoptic laryngoscope (physical object),</p> <p>44738004 Laryngoscope device (physical object),</p> <p>469919007 Flexible video laryngoscope (physical object),</p> <p>70065001 Rigid intubation laryngoscope (physical object),</p> <p>701054002 Flexible fiberoptic intubation laryngoscope (physical object),</p>
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706013009 Intubation laryngoscope (physical object),  
734928009 Rigid non-bladed video intubation laryngoscope  
(physical object),  
879788006 Channeled video intubation laryngoscope (physical  
object))

**Population 3:**

Initial Population  
and  
(  
[ePatient.15 Age](#) is less than 18  
and  
[ePatient.16 Age Units](#) is 2516009 (“Years”)  
or (  
[ePatient.15 Age](#) is less than or equal to 120  
and  
[ePatient.16 Age Units](#) is in  
(  
2516001 (“Days”),  
2516003 (“Hours”),  
2516005 (“Minutes”),  
2516007 (“Months”))))  
and  
[eProcedures.03 Procedure](#) is in  
(  
429705000 Intubation, combitube (procedure),  
424979004 Laryngeal mask airway insertion (procedure),  
427753009 Insertion of esophageal tracheal double lumen  
supraglottic airway (procedure),  
450611000124100 Insertion of Single Lumen Supraglottic Airway  
Device (procedure))

**Population 4:**

Initial Population  
and  
(  
[ePatient.15 Age](#) is greater than or equal to 18  
and  
[ePatient.16 Age Units](#) is 2516009 (“Years”))

**Population 5:**

Initial Population  
and



	<p>(</p> <p><a href="#">ePatient.15 Age</a> is greater than or equal to 18</p> <p>and</p> <p><a href="#">ePatient.16 Age Units</a> is 2516009 (“Years”))</p> <p>and</p> <p><a href="#">eProcedures.03 Procedure</a> is in</p> <p>(</p> <p>683005 Indirect laryngoscopy (procedure),</p> <p>49077009 Flexible fiberoptic laryngoscopy (procedure),</p> <p>78121007 Direct laryngoscopy (procedure),</p> <p>112798008 Insertion of endotracheal tube (procedure),</p> <p>16883004 Endotracheal intubation, emergency procedure (procedure),</p> <p>182682004 Emergency laryngeal intubation (procedure),</p> <p>232674004 Orotracheal intubation (procedure),</p> <p>232677006 Tracheal intubation using rigid bronchoscope (procedure),</p> <p>232678001 Orotracheal fiberoptic intubation (procedure),</p> <p>2326700089 Nasotracheal intubation (procedure),</p> <p>232682004 Nasotracheal fiberoptic intubation (procedure),</p> <p>232680007 Nasal intubation awake (procedure),</p> <p>241689008 Intubation, Rapid Sequence Intubation (RSI) (procedure),</p> <p>304341005 Awake intubation (procedure),</p> <p>397892004 Retrograde intubation (procedure),</p> <p>418613003 Tracheal intubation through a laryngeal mask airway (procedure),</p> <p>429161001 Insertion of endotracheal tube using laryngoscope (procedure),</p> <p>450601000124103 Intubation, orotracheal (procedure),</p> <p>1141752008 Flexible video intubation laryngoscope (physical object),</p> <p>285696003 Fiberoptic laryngoscope (physical object),</p> <p>420311007 Flexible fiberoptic laryngoscope (physical object),</p> <p>421100004 Rigid fiberoptic laryngoscope (physical object),</p> <p>44738004 Laryngoscope device (physical object),</p> <p>469919007 Flexible video laryngoscope (physical object),</p> <p>70065001 Rigid intubation laryngoscope (physical object),</p> <p>701054002 Flexible fiberoptic intubation laryngoscope (physical object),</p> <p>706013009 Intubation laryngoscope (physical object),</p> <p>734928009 Rigid non-bladed video intubation laryngoscope (physical object),</p> <p>879788006 Channeled video intubation laryngoscope (physical object))</p>
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	<p><b>Population 6:</b></p> <p>Initial Population</p> <p>and ( <a href="#">ePatient.15 Age</a> is greater than or equal to 18 and <a href="#">ePatient.16 Age Units</a> is 2516009 (“Years”)) and</p> <p><a href="#">eProcedures.03 Procedure</a> is in ( 429705000 Intubation, combitube (procedure), 424979004 Laryngeal mask airway insertion (procedure), 427753009 Insertion of esophageal tracheal double lumen supraglottic airway (procedure), 450611000124100 Insertion of Single Lumen Supraglottic Airway Device (procedure))</p>
<p><b>Denominator Exclusions</b></p>	<p>First invasive airway procedures where additional invasive airway procedures are documented at the same date/time</p>
<p><b>Denominator Exclusion Pseudocode</b></p>	<p style="text-align: center;"><b>NEMESIS</b></p> <p>eProcedures.ProcedureGroup exists where ( <a href="#">eProcedures.03 Procedure</a> is in ( 683005 Indirect laryngoscopy (procedure), 49077009 Flexible fiberoptic laryngoscopy (procedure), 78121007 Direct laryngoscopy (procedure), 112798008 Insertion of endotracheal tube (procedure), 16883004 Endotracheal intubation, emergency procedure (procedure), 182682004 Emergency laryngeal intubation (procedure), 232674004 Orotracheal intubation (procedure), 232677006 Tracheal intubation using rigid bronchoscope (procedure), 232678001 Orotracheal fiberoptic intubation (procedure), 2326700089 Nasotracheal intubation (procedure), 232682004 Nasotracheal fiberoptic intubation (procedure), 232680007 Nasal intubation awake (procedure), 232685002 Insertion of tracheostomy tube (procedure), 232686001 Insertion of tracheal T-tube (procedure), 241689008 Intubation, Rapid Sequence Intubation (RSI) (procedure), 304341005 Awake intubation (procedure),</p>

	<p>397892004 Retrograde intubation (procedure),  418613003 Tracheal intubation through a laryngeal mask airway (procedure),  429705000 Intubation, combitube (procedure),  424979004 Laryngeal mask airway insertion (procedure),  427753009 Insertion of esophageal tracheal double lumen supraglottic airway (procedure),  429161001 Insertion of endotracheal tube using laryngoscope (procedure),  450601000124103 Intubation, orotracheal (procedure),  450611000124100 Insertion of Single Lumen Supraglottic Airway Device (procedure),  1141752008 Flexible video intubation laryngoscope (physical object),  285696003 Fiberoptic laryngoscope (physical object),  420311007 Flexible fiberoptic laryngoscope (physical object),  421100004 Rigid fiberoptic laryngoscope (physical object),  44738004 Laryngoscope device (physical object),  469919007 Flexible video laryngoscope (physical object),  70065001 Rigid intubation laryngoscope (physical object),  701054002 Flexible fiberoptic intubation laryngoscope (physical object),  706013009 Intubation laryngoscope (physical object),  734928009 Rigid non-bladed video intubation laryngoscope (physical object),  879788006 Channeled video intubation laryngoscope (physical object))</p> <p>and</p> <p><a href="#">eProcedures.01 Date/Time Procedure Performed</a> is at <a href="#">eProcedures.01 Date/Time Procedure Performed</a> of the first airway procedure)</p>
<b>Denominator Exceptions</b>	None
<b>Numerator Statement</b>	<b>Numerator Statement for Populations 1-6:</b> Successful first invasive airway placements
<b>Numerator Pseudocode</b>	<p style="text-align: center;"><b>NEMESIS</b></p> <p><b>Numerator 1: (Apply to Populations 1-6, Calculate 6 Rates):</b>  ( <a href="#">eProcedures.05 Number of Procedure Attempts</a> = 1  and <a href="#">eProcedures.06 Procedure Successful</a> is 9923003 (“Yes”))</p>

## Airway-21: BVM or SGA for Pediatric Patients in Cardiac Arrest

**Measure Score Interpretation:** For this measure, a higher score indicates better quality.

<b>Measure Description</b>	
Percentage of EMS responses originating from a 911 request for patients less than 18 years of age in cardiac arrest who receive assisted ventilation during the EMS response in which either a bag-valve-mask airway alone or a bag-valve-mask with supraglottic airway is used.	
<b>Measure Components</b>	
<b>Initial Population</b>	All EMS responses from 911 requests for patients less than 18 years of age in cardiac arrest who receive assisted ventilation during the EMS response
<b>Initial Population Pseudocode</b>	<b>NEMESIS</b>
	( <a href="#">eProcedures.03 Procedure</a> is in ( 683005 Indirect laryngoscopy (procedure), 49077009 Flexible fiberoptic laryngoscopy (procedure), 78121007 Direct laryngoscopy (procedure), 112798008 Insertion of endotracheal tube (procedure), 16883004 Endotracheal intubation, emergency procedure (procedure), 182682004 Emergency laryngeal intubation (procedure), 232674004 Orotracheal intubation (procedure), 232677006 Tracheal intubation using rigid bronchoscope (procedure), 232678001 Orotracheal fiberoptic intubation (procedure), 2326700089 Nasotracheal intubation (procedure), 232682004 Nasotracheal fiberoptic intubation (procedure), 232680007 Nasal intubation awake (procedure), 241689008 Intubation, Rapid Sequence Intubation (RSI) (procedure), 304341005 Awake intubation (procedure), 397892004 Retrograde intubation (procedure), 418613003 Tracheal intubation through a laryngeal mask airway (procedure), 429705000 Intubation, combitube (procedure), 424979004 Laryngeal mask airway insertion (procedure), 425447009 Bag valve mask ventilation (procedure), 425696007 Manual respiratory assistance using bag and mask (procedure), 427753009 Insertion of esophageal tracheal double lumen supraglottic airway (procedure), 429161001 Insertion of endotracheal tube using laryngoscope (procedure), 450601000124103 Intubation, orotracheal (procedure), 450611000124100 Insertion of Single Lumen Supraglottic Airway Device (procedure),

	<p>1141752008 Flexible video intubation laryngoscope (physical object),  285696003 Fiberoptic laryngoscope (physical object),  420311007 Flexible fiberoptic laryngoscope (physical object),  421100004 Rigid fiberoptic laryngoscope (physical object),  44738004 Laryngoscope device (physical object),  469919007 Flexible video laryngoscope (physical object),  70065001 Rigid intubation laryngoscope (physical object),  701054002 Flexible fiberoptic intubation laryngoscope (physical object),  706013009 Intubation laryngoscope (physical object),  734928009 Rigid non-bladed video intubation laryngoscope (physical object),  879788006 Channeled video intubation laryngoscope (physical object))</p> <p>and</p> <p><a href="#">eArrest.01 Cardiac Arrest</a> is in  (  3001003 (“Yes, Prior to Any EMS Arrival (Includes Transport EMS &amp; Medical First Responders)”),  3001005 (“Yes, After Any EMS Arrival (Includes Transport EMS &amp; Medical First Responders)”)</p> <p>and</p> <p><a href="#">eResponse.05 Type of Service Requested</a> is in  (  2205001 (“Emergency Response (Primary Response Area)”),  2205003 (“Emergency Response (Intercept)”),  2205009 (“Emergency Response (Mutual Aid)”)</p> <p>and</p> <p>((</p> <p><a href="#">ePatient.15 Age</a> is less than 18</p> <p>and</p> <p><a href="#">ePatient.16 Age Units</a> is 2516009 (“Years”))</p> <p>or (  <a href="#">ePatient.15 Age</a> is less than or equal to 120</p> <p>and</p> <p><a href="#">ePatient.16 Age Units</a> is in  (  2516001 (“Days”),  2516003 (“Hours”),  2516005 (“Minutes”),  2516007 (“Months”))))))</p>
<b>Denominator Statement</b>	Encounters in the initial population

<b>Denominator Pseudocode</b>	<b>NEMESIS</b>
	Equals Initial Population
<b>Denominator Exclusions</b>	None
<b>Denominator Exceptions</b>	None
<b>Numerator Statement</b>	EMS responses in which either a bag-valve-mask airway alone or a bag-valve-mask with supraglottic airway is used.  <i>(pseudocode implemented as endotracheal intubation not used)</i>
<b>Numerator Pseudocode</b>	<b>NEMESIS</b>  <a href="#">eProcedures.03 Procedure</a> is not in ( 683005 Indirect laryngoscopy (procedure), 49077009 Flexible fiberoptic laryngoscopy (procedure), 78121007 Direct laryngoscopy (procedure), 112798008 Insertion of endotracheal tube (procedure), 16883004 Endotracheal intubation, emergency procedure (procedure), 182682004 Emergency laryngeal intubation (procedure), 232674004 Orotracheal intubation (procedure), 232677006 Tracheal intubation using rigid bronchoscope (procedure), 232678001 Orotracheal fiberoptic intubation (procedure), 2326700089 Nasotracheal intubation (procedure), 232682004 Nasotracheal fiberoptic intubation (procedure), 232680007 Nasal intubation awake (procedure), 241689008 Intubation, Rapid Sequence Intubation (RSI) (procedure), 304341005 Awake intubation (procedure), 397892004 Retrograde intubation (procedure), 418613003 Tracheal intubation through a laryngeal mask airway (procedure), 429161001 Insertion of endotracheal tube using laryngoscope (procedure), 450601000124103 Intubation, oro-tracheal (procedure), 1141752008 Flexible video intubation laryngoscope (physical object), 285696003 Fiberoptic laryngoscope (physical object), 420311007 Flexible fiberoptic laryngoscope (physical object), 421100004 Rigid fiberoptic laryngoscope (physical object), 44738004 Laryngoscope device (physical object), 469919007 Flexible video laryngoscope (physical object), 70065001 Rigid intubation laryngoscope (physical object), 701054002 Flexible fiberoptic intubation laryngoscope (physical object),

	706013009 Intubation laryngoscope (physical object), 734928009 Rigid non-bladed video intubation laryngoscope (physical object), 879788006 Channeled video intubation laryngoscope (physical object))
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**Airway-22: Use of Sedation Prior to Intubation when Paralytics are Given**  
**Measure Score Interpretation:** For this measure, a higher score indicates better quality.

Measure Description	
Percentage of EMS responses originating from a 911 request for: <ol style="list-style-type: none"> <li>a. Patients less than 18 years of age who receive a paralytic medication to facilitate endotracheal intubation for whom a sedative medication is administered prior to receiving paralytics.</li> <li>b. Patients greater than or equal to 18 years of age who receive a paralytic medication to facilitate endotracheal intubation for whom a sedative medication is administered prior to receiving paralytics.</li> </ol>	
Measure Components	
<b>Initial Population</b>	All EMS responses originating from a 911 request for patients who receive a paralytic medication to facilitate endotracheal intubation
<b>Initial Population Pseudocode</b>	<p style="text-align: center;"><b>NEMESIS</b></p> <pre> ( eProcedures.ProcedureGroup exists where (   <a href="#">eProcedures.03 Procedure</a> is in   (     683005 Indirect laryngoscopy (procedure),     49077009 Flexible fiberoptic laryngoscopy (procedure),     78121007 Direct laryngoscopy (procedure),     112798008 Insertion of endotracheal tube (procedure),     16883004 Endotracheal intubation, emergency procedure (procedure),     182682004 Emergency laryngeal intubation (procedure),     232674004 Orotracheal intubation (procedure),     232677006 Tracheal intubation using rigid bronchoscope (procedure),     232678001 Orotracheal fiberoptic intubation (procedure),     2326700089 Nasotracheal intubation (procedure),     232682004 Nasotracheal fiberoptic intubation (procedure),     232680007 Nasal intubation awake (procedure),     241689008 Intubation, Rapid Sequence Intubation (RSI)     304341005 Awake intubation (procedure),     397892004 Retrograde intubation (procedure),     418613003 Tracheal intubation through a laryngeal mask airway (procedure),   ) )           </pre>

	<p>429161001 Insertion of endotracheal tube using laryngoscope (procedure),  450601000124103 Intubation, orotracheal (procedure),  1141752008 Flexible video intubation laryngoscope (physical object),  285696003 Fiberoptic laryngoscope (physical object),  420311007 Flexible fiberoptic laryngoscope (physical object),  421100004 Rigid fiberoptic laryngoscope (physical object),  44738004 Laryngoscope device (physical object),  469919007 Flexible video laryngoscope (physical object),  70065001 Rigid intubation laryngoscope (physical object),  701054002 Flexible fiberoptic intubation laryngoscope (physical object),  706013009 Intubation laryngoscope (physical object),  734928009 Rigid non-bladed video intubation laryngoscope (physical object),  879788006 Channeled video intubation laryngoscope (physical object))</p> <p>and</p> <p><a href="#">eProcedures.01 Date/Time Procedure</a> Performed is not in  ( Null,  7701001 (“Not Applicable”),  7701003 (“Not Recorded”))</p> <p>and</p> <p><a href="#">eProcedures.02 Procedure Performed Prior to this Unit’s EMS Care</a> is not 9923003 (“Yes”))</p> <p>and</p> <p>eMedications.MedicationGroup exists where (    first (<a href="#">eMedications.03 Medication Administered</a> is in  ( 68139 Rocuronium,  10154 Succinylcholine,  71535 Vecuronium)</p> <p>and</p> <p><a href="#">eMedications.01 Date/Time Medication Administered</a> is not in  ( Null,  7701001 (“Not Applicable”),  7701003 (“Not Recorded”))))</p> <p>and (  <a href="#">eMedications.01 Date/Time Medication Administered</a></p>
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	<p>is at or before  <a href="#">eProcedures.01 Date/Time Procedure Performed</a>)</p> <p>and  <a href="#">eResponse.05 Type of Service Requested</a> is  ( 2205001 (“Emergency Response (Primary Response Area)”), 2205003 (“Emergency Response (Intercept)”), 2205009 (“Emergency Response (Mutual Aid)”))</p>
<b>Denominator Statement</b>	<p><b>Population 1:</b>  EMS responses in the initial population for patients less than 18 years of age</p> <p><b>Population 2:</b>  EMS responses in the initial population for patients greater than or equal to 18 years of age</p>
<b>Denominator Pseudocode</b>	<p style="text-align: center;"><b>NEMESIS</b></p> <p><b>Population 1:</b></p> <p>Initial Population  and  ((  <a href="#">ePatient.15 Age</a> is less than 18  and  <a href="#">ePatient.16 Age Units</a> is 2516009 (“Years”))  or (  <a href="#">ePatient.15 Age</a> is less than or equal to 120  and  <a href="#">ePatient.16 Age Units</a> is in  (  2516001 (“Days”),  2516003 (“Hours”),  2516005 (“Minutes”),  2516007 (“Months”))))</p> <p><b>Population 2:</b></p> <p>Initial Population  and  (  <a href="#">ePatient.15 Age</a> is greater than or equal to 18  and  <a href="#">ePatient.16 Age Units</a> is 2516009 (“Years”))</p>

<b>Denominator Exclusions</b>	None
<b>Denominator Exceptions</b>	None
<b>Numerator Statement</b>	All EMS responses in which sedative mediation is administered at or before paralytic medications
<b>Numerator Pseudocode</b>	<p style="text-align: center;"><b>NEMESIS</b></p> <p>(  eMedications.MedicationGroup exists where (    <a href="#">eMedications.03 Medication Administered</a> is in  (  3322 Diazepam,  4177 Etomidate,  6130 Ketamine,  6470 Lorazepam,  6960 Midazolam,  8782 Propofol)  and  <a href="#">eMedications.01 Date/Time Medication Administered</a> is not in  (  Null,  7701001 (“Not Applicable”),  7701003 (“Not Recorded”)))  and  eMedications.MedicationGroup exists where (    <a href="#">eMedications.03 Medication Administered</a> is in  (  68139 Rocuronium,  10154 Succinylcholine,  71535 Vecuronium))  and (  <a href="#">eMedications.01 Date/Time Medication Administered</a> (<i>sedative group</i>) is at or before  <a href="#">eMedications.01 Date/Time Medication Administered</a> (<i>paralytic group</i>) of the current medication))</p>

**Airway-23: Use of Analgesia and Sedation Post Intubation**

**Measure Score Interpretation:** For this measure, a higher score indicates better quality

<b>Measure Description</b>
Percentage of first successful intubation procedures during EMS responses originating from a 911 request for:

<p>a. Patients less than 18 years of age who receive analgesia and sedation medications post intubation.</p> <p>b. Patients greater than or equal to 18 years of age who receive analgesia and sedation medications post intubation.</p>	
<b>Measure Components</b>	
<b>Initial Population</b>	All initial (first) successful intubation procedures for patients in EMS responses originating from a 911 request
<b>Initial Population Pseudocode</b>	<p style="text-align: center;"><b>NEMESIS</b></p> <p>(  eProcedures.ProcedureGroup where (    first (<a href="#">eProcedures.03 Procedure</a> is in  (  683005 Indirect laryngoscopy (procedure),  49077009 Flexible fiberoptic laryngoscopy (procedure),  78121007 Direct laryngoscopy (procedure),  112798008 Insertion of endotracheal tube (procedure),  16883004 Endotracheal intubation, emergency procedure (procedure),  182682004 Emergency laryngeal intubation (procedure),  232674004 Orotracheal intubation (procedure),  232677006 Tracheal intubation using rigid bronchoscope (procedure),  232678001 Orotracheal fiberoptic intubation (procedure),  2326700089 Nasotracheal intubation (procedure),  232682004 Nasotracheal fiberoptic intubation (procedure),  232680007 Nasal intubation awake (procedure),  241689008 Intubation, Rapid Sequence Intubation (RSI)  304341005 Awake intubation (procedure),  397892004 Retrograde intubation (procedure),  418613003 Tracheal intubation through a laryngeal mask airway (procedure),  429161001 Insertion of endotracheal tube using laryngoscope (procedure),  450601000124103 Intubation, orotracheal (procedure),  1141752008 Flexible video intubation laryngoscope (physical object),  285696003 Fiberoptic laryngoscope (physical object),  420311007 Flexible fiberoptic laryngoscope (physical object),  421100004 Rigid fiberoptic laryngoscope (physical object),  44738004 Laryngoscope device (physical object),  469919007 Flexible video laryngoscope (physical object),  70065001 Rigid intubation laryngoscope (physical object),  701054002 Flexible fiberoptic intubation laryngoscope (physical object),  706013009 Intubation laryngoscope (physical object),</p>

	<p>734928009 Rigid non-bladed video intubation laryngoscope (physical object), 879788006 Channeled video intubation laryngoscope (physical object))</p> <p>and</p> <p><a href="#">eProcedures.01 Date/Time Procedure</a> Performed is not in ( Null, 7701001 (“Not Applicable”), 7701003 (“Not Recorded”))</p> <p>and</p> <p><a href="#">eProcedures.02 Procedure Performed Prior to this Unit’s EMS Care</a> is not 9923003 (“Yes”)</p> <p>and</p> <p><a href="#">eProcedures.05 Number of Procedure Attempts</a> = 1</p> <p>and</p> <p><a href="#">eProcedures.06 Procedure Successful</a> is 9923003 (“Yes”))</p> <p>and</p> <p><a href="#">eResponse.05 Type of Service Requested</a> is ( 2205001 (“Emergency Response (Primary Response Area)”), 2205003 (“Emergency Response (Intercept)”), 2205009 (“Emergency Response (Mutual Aid)”))</p>
<p><b>Denominator Statement</b></p>	<p><b>Population 1:</b> First attempted successful intubation procedures from EMS responses in the initial population for patients less than 18 years of age</p> <p><b>Population 2:</b> First attempted successful intubation procedures from EMS responses in the initial population for patients greater than or equal to 18 years of age</p>
<p><b>Denominator Pseudocode</b></p>	<p style="text-align: center;"><b>NEMESIS</b></p> <p><b>Population 1:</b></p> <p>Initial Population</p> <p>and</p> <p>((</p> <p><a href="#">ePatient.15 Age</a> is less than 18</p> <p>and</p> <p><a href="#">ePatient.16 Age Units</a> is 2516009 (“Years”))</p> <p>or (</p> <p><a href="#">ePatient.15 Age</a> is less than or equal to 120</p> <p>and</p> <p><a href="#">ePatient.16 Age Units</a> is in</p>

	<p>(  2516001 (“Days”),  2516003 (“Hours”),  2516005 (“Minutes”),  2516007 (“Months”)))))</p> <p><b>Population 2:</b></p> <p>Initial Population  and  (  <a href="#">ePatient.15 Age</a> is greater than or equal to 18  and  <a href="#">ePatient.16 Age Units</a> is 2516009 (“Years”))</p>
<b>Denominator Exclusions</b>	Procedures for patients in cardiac arrest at any point during the EMS encounter or First successful intubation procedures where additional invasive airway procedures are documented at the same date/time
<b>Denominator Exclusion Pseudocode</b>	<p style="text-align: center;"><b>NEMESIS</b></p> <p>(  <a href="#">eArrest.01 Cardiac Arrest</a> is in  (  3001003 (“Yes, Prior to Any EMS Arrival (includes Transport EMS &amp; Medical First Responders”)),  3001005 (“Yes, After Any EMS Arrival (includes Transport EMS &amp; Medical First Responders”))  or  (  eProcedures.ProcedureGroup exists where (  <a href="#">eProcedures.03 Procedure</a> is in  (  683005 Indirect laryngoscopy (procedure),  49077009 Flexible fiberoptic laryngoscopy (procedure),  78121007 Direct laryngoscopy (procedure),  112798008 Insertion of endotracheal tube (procedure),  16883004 Endotracheal intubation, emergency procedure (procedure),  182682004 Emergency laryngeal intubation (procedure),  232674004 Orotracheal intubation (procedure),  232677006 Tracheal intubation using rigid bronchoscope (procedure),  232678001 Orotracheal fiberoptic intubation (procedure),</p>

	<p>2326700089 Nasotracheal intubation (procedure),  232682004 Nasotracheal fiberoptic intubation (procedure),  232680007 Nasal intubation awake (procedure),  241689008 Intubation, Rapid Sequence Intubation (RSI)  304341005 Awake intubation (procedure),  397892004 Retrograde intubation (procedure),  418613003 Tracheal intubation through a laryngeal mask airway (procedure),  429161001 Insertion of endotracheal tube using laryngoscope (procedure),  450601000124103 Intubation, orotracheal (procedure),  1141752008 Flexible video intubation laryngoscope (physical object),  285696003 Fiberoptic laryngoscope (physical object),  420311007 Flexible fiberoptic laryngoscope (physical object),  421100004 Rigid fiberoptic laryngoscope (physical object),  44738004 Laryngoscope device (physical object),  469919007 Flexible video laryngoscope (physical object),  70065001 Rigid intubation laryngoscope (physical object),  701054002 Flexible fiberoptic intubation laryngoscope (physical object),  706013009 Intubation laryngoscope (physical object),  734928009 Rigid non-bladed video intubation laryngoscope (physical object),  879788006 Channeled video intubation laryngoscope (physical object))</p> <p>and</p> <p><a href="#">eProcedures.01 Date/Time Procedure Performed</a> is at <a href="#">eProcedures.01 Date/Time Procedure Performed</a> of the first airway procedure)))</p>
<b>Denominator Exceptions</b>	None
<b>Denominator Exception Pseudocode</b>	N/A
<b>Numerator Statement</b>	First successful intubation procedures in which analgesia and sedative medications are administered post intubation
<b>Numerator Pseudocode</b>	<p style="text-align: center;"><b>NEMSIS</b></p> <p>(  eMedications.MedicationGroup exists where (    <a href="#">eMedications.03 Medication Administered</a> is 6130 Ketamine  and  <a href="#">eMedications.01 Date/Time Medication Administered</a> is not in  (  Null,</p>

	<p>7701001 (“Not Applicable”), 7701003 (“Not Recorded”))</p> <p>and</p> <p><a href="#">eMedications.01 Date/Time Medication Administered</a> is at or after <a href="#">eProcedures.01 Date/Time Procedure Performed</a> of the current procedure)</p> <p>or (</p> <p>eMedications.MedicationGroup exists where (</p> <p><a href="#">eMedications.03 Medication Administered</a> is in</p> <p>(</p> <p>3423 Hydromorphone, 4337 Fentanyl, 7052 Morphine)</p> <p>and</p> <p><a href="#">eMedications.01 Date/Time Medication Administered</a> is not in</p> <p>(</p> <p>Null, 7701001 (“Not Applicable”), 7701003 (“Not Recorded”))</p> <p>and</p> <p><a href="#">eMedications.01 Date/Time Medication Administered</a> is at or after <a href="#">eProcedures.01 Date/Time Procedure Performed</a> of the current procedure)</p> <p>and</p> <p>eMedications.MedicationGroup exists where (</p> <p><a href="#">eMedications.03 Medication Administered</a> is in</p> <p>(</p> <p>3322 Diazepam 4177 Etomidate, 6470 Lorazepam, 6960 Midazolam, 8782 Propofol)</p> <p>and</p> <p><a href="#">eMedications.01 Date/Time Medication Administered</a> is not in</p> <p>(</p> <p>Null, 7701001 (“Not Applicable”), 7701003 (“Not Recorded”))</p> <p>and</p> <p><a href="#">eMedications.01 Date/Time Medication Administered</a> is at or after <a href="#">eProcedures.01 Date/Time Procedure Performed</a> of the current procedure)))</p>
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## Airway 24: Improvement in Hypoxia

**Measure Score Interpretation:** For this measure, a higher score indicates better quality.

Measure Description	
Percentage of EMS responses originating from a 911 request for patients with hypoxia and a provider impression of respiratory distress for whom SPO2 improves to greater than 90%.	
Measure Components	
Initial Population	All EMS responses originating from a 911 request for patients with initial SPO2 of less than 90 and with a provider impression of respiratory distress
Initial Population Pseudocode	<p style="text-align: center;"><b>NEMESIS</b></p> <p>(              (first (<a href="#">eVitals.12 Pulse Oximetry</a>) is less than 90          where              (                  (                      <a href="#">eVitals.01 Date/Time Vital Signs Taken</a> is not in                      (                          Null,                          7701001 (“Not Applicable”),                          7701003 (“Not Recorded”))                      and                      <a href="#">eVitals.02 Obtained Prior to this Unit’s EMS Care</a> is not 9923003                      (“Yes”))                  sorted by <a href="#">eVitals.01 Date/Time Vital Signs Taken</a>))              and              (                  (                      <a href="#">eSituation.11 Provider's Primary Impression</a> matches                      /^\I50.9 J00 J05 J18.9 J20.9 J45.901 J80 J81 J93.9 J96 J98.01                       J98.9 R05 R06 R06.00 R09.2  T17.9/                      (“Heart failure, unspecified,”                      “Acute nasopharyngitis....,”                      “Acute obstructive laryngitis and epiglottitis....,”                      “Pneumonia, unspecified organism,”                      “Acute bronchitis, unspecified,”                      “Unspecified asthma with (acute) exacerbation,”                      “Acute respiratory distress syndrome,”                      “Pulmonary edema....,”                      “Pneumothorax, unspecified,”                      “Respiratory failure, unspecified,”                      “Acute bronchospasm,”                      “Respiratory disorder, unspecified,”                      “Cough,”                      “Abnormalities of breathing,”                      “Dyspnea, unspecified,”                      “Respiratory arrest,” or                      “Foreign body in respiratory tract, part unspecified”))                  ))              ))</p>



	<p>or <a href="#">eSituation.12 Provider's Secondary Impressions</a> matches  /^(I50.9 J00 J05 J18.9 J20.9 J45.901 J80 J81 J93.9 J96 J98.01 J98.9 R05   R06 R06.00 R09.2  T17.9/  ("Heart failure, unspecified,"  "Acute nasopharyngitis....,"  "Acute obstructive laryngitis and epiglottitis...,"  "Pneumonia, unspecified organism,"  "Acute bronchitis, unspecified,"  "Unspecified asthma with (acute) exacerbation,"  "Acute respiratory distress syndrome,"  "Pulmonary edema....,"  "Pneumothorax, unspecified,"  "Respiratory failure, unspecified,"  "Acute bronchospasm,"  "Respiratory disorder, unspecified,"  "Cough,"  "Abnormalities of breathing,"  "Respiratory disorder, unspecified,"  "Respiratory arrest," or  "Foreign body in respiratory tract, part unspecified"))</p> <p>and  <a href="#">eResponse.05 Type of Service Requested</a> is in  (  2205001 ("Emergency Response (Primary Response Area)"),  2205003 ("Emergency Response (Intercept)"),  2205009 ("Emergency Response (Mutual Aid)"))</p> <p>and  (  <a href="#">eDisposition.28 Patient Evaluation/Care</a> is 4228001 ("Patient Evaluated and  Care Provided"))</p> <p>or  <a href="#">eDisposition.12 Incident/Patient Disposition</a> is in  (  4212029 ("Patient Treated, Released (per protocol)"),  4212031 ("Patient Treated, Transferred Care to Another EMS Unit"),  4212033 ("Patient Treated, Transported by this EMS Unit"),  4212035 ("Patient Treated, Transported by Law Enforcement"),  4212037 ("Patient Treated, Transported by Private Vehicle"))))</p>
<b>Denominator Statement</b>	<b>Population 1:</b> EMS responses in the initial population for patients less than 18 years of age  <b>Population 2:</b> EMS responses in the initial population for patients greater than or equal to 18 years of age

<b>Denominator Pseudocode</b>	<p style="text-align: center;"><b>NEMESIS</b></p> <p><b>Population 1:</b></p> <p>Initial Population  and ((      <a href="#">ePatient.15 Age</a> is less than 18  and      <a href="#">ePatient.16 Age Units</a> is 2516009 (“Years”))  or (      <a href="#">ePatient.15 Age</a> is less than or equal to 120  and      <a href="#">ePatient.16 Age Units</a> is in      (          2516001 (“Days”),          2516003 (“Hours”),          2516005 (“Minutes”),          2516007 (“Months”))))</p> <p><b>Population 2:</b></p> <p>Initial Population  and (      <a href="#">ePatient.15 Age</a> is greater than or equal to 18  and      <a href="#">ePatient.16 Age Units</a> is 2516009 (“Years”))</p>
<b>Denominator Exclusions</b>	<p><b>Denominator Exclusion for Population 1:</b></p> <p>EMS responses for patients less than 24 hours of age</p> <p><b>Denominator Exclusion for Population 1-2:</b></p> <p>EMS responses for patients with &lt;2 SPO2 values documented</p>
<b>Denominator Exclusions Pseudocode</b>	<p style="text-align: center;"><b>NEMESIS</b></p> <p><b>Apply Denominator Exclusion to Population 1:</b></p> <p>((      <a href="#">ePatient.15 Age</a> is less than 24  and      <a href="#">ePatient.16 Age Units</a> is 2516003 (“Hours”))  or (      <a href="#">ePatient.15 Age</a> is less than 120  and</p>

	<p><a href="#">ePatient.16 Age Units</a> is 2516005 (“Minutes”))</p> <p><b>Apply Denominator Exclusion to Populations 1-2:</b></p> <p>(</p> <p>    <a href="#">eVitals.12 Pulse Oximetry</a> is not in</p> <p>    (</p> <p>        Null,</p> <p>        7701001 (“Not Applicable”),</p> <p>        7701003 (“Not Recorded”))</p> <p>    and</p> <p>    (Count (<a href="#">eVitals.12 Pulse Oximetry</a> &lt;2)))</p>
<b>Denominator Exceptions</b>	None
<b>Numerator Statement</b>	<p><b>Numerator Statement for Populations 1-2:</b></p> <p>EMS responses for patients whose last SPO2 is greater than 90%</p>
<b>Numerator Pseudocode</b>	<p style="text-align: center;"><b>NEMSIS</b></p> <p><b>Numerator for Populations 1-2 (Calculate 2 Rates):</b></p> <p>    (last (<a href="#">eVitals.12 Pulse Oximetry</a> is greater than 90</p> <p>where</p> <p>    (</p> <p>        <a href="#">eVitals.01 Date/Time Vital Signs Taken</a> is not in</p> <p>        (</p> <p>            Null,</p> <p>            7701001 (“Not Applicable”),</p> <p>            7701003 (“Not Recorded”))</p> <p>        sorted by <a href="#">eVitals.01 Date/Time Vital Signs Taken</a>)))</p>