OUTCOMES

✓ SUCCESSFUL SEDATION (POSITIVE OR GOOD)

✓ UNSUCCESSFUL SEDATION (NEGATIVE OR BAD)
DEFINITION OF SUCCESS

SUC·CESS
/səkˈses/ (ˈsək-)
noun
the accomplishment of an aim or purpose.
"the president had some success in restoring confidence"
synonyms: favorable outcome, successfulness, successful result, triumph; Hollywood ending
"the success of the scheme"
• the attainment of popularity or profit.
"the success of his play"
synonyms: prosperity, affluence, wealth, riches, opulence
"the trappings of success"
• a person or thing that achieves desired aims or attains prosperity.
"I must make a success of my business"
synonyms: triumph, bestseller, blockbuster, sellout; More

SUCCESSFUL SEDATION
✓ ALL PLANNED WORK COMPLETED SATISFACTORILY
✓ PART OF PLANNED WORK COMPLETED SATISFACTORILY
✓ PATIENT IS DISCHARGED TO HOME WITHOUT EVENT

UNSUCCESSFUL SEDATION
✓ PLANNED WORK NOT COMPLETED
✓ PLANNED WORK COMPLETED UNDER DURESS OR OF POOR QUALITY
✓ PATIENT IS DISCHARGED TO HOME WITHOUT EVENT
✓ PATIENT IS NOT DISCHARGED TO HOME BECAUSE OF AN ADVERSE EVENT
UNSUCCESSFUL SEDATION

• NOT DISCHARGED TO HOME BECAUSE OF EVENT
  • DISCHARGED TO HOSPITAL OR OTHER CARE FACILITY: POSSIBLE OUTCOMES
    • FULL RECOVERY
    • PARTIAL RECOVERY
    • NO RECOVERY

FACTORS IN BAD OUTCOMES

• INADEQUATE TRAINING
• INADEQUATE MONITORING
• FAILURE TO RECOGNIZE AN EMERGENCY
• FAILURE TO FOLLOW STANDARDS OF CARE AND SAFE PRACTICES
• LACK OF A “BACKBONE”
INADEQUATE TRAINING

• A WEEKEND COURSE IS NOT ENOUGH!
• MUST BE TRAINED TO RESCUE ONE LEVEL BEYOND INTENDED DEPTH OF SEDATION
  • REQUIRES GOOD UNDERSTANDING OF THE CONTINUUM OF SEDATION
  • SHOULD HAVE PLENTY OF EXPERIENCE DOING THIS WHILE SOMEONE ELSE IS THERE TO SAVE YOUR BACON
• SHOULD BE TRAINED FOR THE POPULATION YOU ARE TREATING
  • ADULTS VS CHILDREN
  • HEALTHY VS SICK

CONTINUUM OF SEDATION

<table>
<thead>
<tr>
<th>Description</th>
<th>Minimal Sedation</th>
<th>Moderate Sedation/Analgesia</th>
<th>Deep Sedation/Analgesia</th>
<th>General Anesthesia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responsiveness</td>
<td>Normal response to verbal stimulation</td>
<td>Purposeful response to verbal or tactile stimulation</td>
<td>Purposeful response following repeated or painful stimulation</td>
<td>No response even with painful stimulus</td>
</tr>
<tr>
<td>Airway</td>
<td>Unaffected</td>
<td>No intervention required</td>
<td>Intervention may be required</td>
<td>Intervention often required</td>
</tr>
<tr>
<td>Spontaneous</td>
<td>Unaffected</td>
<td>Adequate</td>
<td>Maybe inadequate</td>
<td>Frequently inadequate</td>
</tr>
<tr>
<td>Ventilation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cardiovascular</td>
<td>Unaffected</td>
<td>Usually maintained</td>
<td>Usually maintained</td>
<td>May be impaired</td>
</tr>
<tr>
<td>Function</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

American Society of Anesthesiologists article, March 2002 Volume 66, Number 3, Practice Management: Sedation and the Need for Anesthesia Personnel Karin Bierstein, J.D.
THE CONCEPT OF “RESCUE” IS ESSENTIAL TO SAFE SEDATION. RECOGNIZING THAT LEVELS OF SEDATION AND ANESTHESIA ARE ALONG A CONTINUUM, IT IS PARAMOUNT THAT THE PROVIDER BE ABLE TO RESCUE A PATIENT FROM UNINTENDED ENTRY TO A MORE PROFOUND LEVEL OF CNS DEPRESSION (AAPD 2007–2008; MALAMED 2010; COTE ET AL. 2000; HOFFMAN ET AL. 2002; AHA 2002). THE ASA IN THEIR GUIDELINES INCLUDE AND STRESS THE CONCEPT OF RESCUE DURING THE ADMINISTRATION OF SEDATION BY “NON-ANESTHESIOLOGISTS” IN AN EFFORT TO REDUCE MORBIDITY AND MORTALITY.
CONTINUUM OF SEDATION

INADEQUATE MONITORING

- STATE REQUIREMENTS/LAWS  (YES, THERE ARE LAWS/REQUIREMENTS!)
- ADA GUIDELINES FOR MONITORING (OVER 12 YEARS OF AGE)
- AAPD GUIDELINES (ADA DEFERS TO THE AAPD BELOW 12 YEARS OF AGE)
- ADA /AAPD
  - MINIMAL
  - MODERATE
  - DEEP SEDATION/GA
FAILURE TO RECOGNIZE AN EMERGENCY

• RESPIRATORY EVENTS
• CARDIOVASCULAR EVENTS
• ALLERGIC REACTIONS

FAILURE TO FOLLOW STANDARDS OF CARE AND SAFE PRACTICES

• PRE-OP EVALUATION/ASSESSMENT
• NPO
• INADEQUATE SUPPLIES OR EQUIPMENT
• MAXIMUM DOSES
• RE-DOISING
FAILURE TO “HAVE A BACKBONE”

- Pressured to perform sedation when you are not comfortable doing so
  - Parents
  - Other doctors
  - Insurance companies
- Not speaking up when something should be said
  - Fear

FACTORS IN BAD OUTCOMES

- Inadequate training
- Inadequate monitoring
- Failure to recognize an emergency
- Failure to follow standards of care and safe practices
- Lack of a “backbone”
JAVIER VILLA (1997)

- 4 YEAR OLD MALE (HEALTHY?)
- BEING SEEN FOR ROUTINE, RESTORATIVE DENTAL CARE (8 CAVITIES)
- JAVIER WAS SEDATED WITH CHLORAL HYDRATE
- PROTECTIVE STABILIZATION WAS USED
- JAVIER WAS RUSHED TO THE HOSPITAL WHERE HE WAS PRONOUNCED DEAD

JAVIER VILLA

- 3 TEETH WERE FIXED AND THE DENTIST WAS STARTING RESTORATION OF THE FOURTH TOOTH
- MUCOUS WAS COMING FROM HIS NOSE AND WHEN THE ASSISTANT WENT TO WIPE IT, SHE NOTICED HIS CHEST WAS NOT RISING AND HE WAS NOT BREATHING
- PRONOUNCED DEAD 30 MINUTES LATER
**JAVIER VILLA: WHAT WENT WRONG?**

- CORONER’S REPORT INITIALLY GAVE CAUSE OF DEATH AS POSITIONAL ASPHYXIATION
- AN AUTOPSY LATER ALSO REVEALED THAT HE HAD MYOCARDITIS
  - THEREFORE, IT COULD NOT BE PROVEN BEYOND A SHADOW OF A DOUBT THAT JAVIER’S DEATH COULD BE SOLEY ATTRIBUTED TO THE SEDATION (DENTIST NOT PROSECUTED FOR MANSLAUGHTER BECAUSE OF THIS)

**FACTORS IN JAVIER VILLA DEATH**

- INADEQUATE TRAINING
  - NEITHER THE PRESCRIBING DOCTOR OR THE TREATING DOCTOR HAD ANY TRAINING BEYOND WHAT IS TAUGHT IN DENTAL SCHOOL (NOT REQUIRED AT THAT TIME)
- FAILURE TO FOLLOW BEST PRACTICES
  - THE PRESCRIBING DOCTOR WAS NOT THE TREATING DOCTOR
  - NO PRE OP EVALUATION
  - THERE WERE NO MONITORS
  - DRUG CHOICE?
  - THE DOSE USED WAS INAPPROPRIATE
  - RECORDS DESTROYED/ALTERED
FAILURE TO FOLLOW BEST PRACTICES (CONTINUED)

• FAILURE TO RECOGNIZE AN EMERGENCY (RESPIRATORY ARREST)
  • CHILD STOPPED BREATHING
  • RECOGNIZED BY AN ASSISTANT

WHERE IS THE POSITIVE IN THIS DEATH?

• JANUARY 2000: IN CA - SEDATION CERTIFICATE REQUIRED FOR CHILDREN 12 YEARS OF AGE AND YOUNGER
NEVAEH HALL

NEVAEH HALL (2016)

• 4 YEAR OLD HEALTHY GIRL
• BEING SEEN FOR ROUTINE RESTORATIVE CARE AND POSSIBLE EXTRACTIONS
• NEVAEH WAS SEDATED USING “SEVERAL SEDATIVES”
  • GIVEN 5 SEDATIVES
• PROCEDURE TOOK MORE THAN 4 HOURS ? NEVAEH WAS IN THE OFFICE FOR OVER 7 HOURS
• PROTECTIVE STABILIZATION WAS USED
• PARAMEDICS WERE EVENTUALLY CALLED AND NEVAEH WAS TAKEN TO THE HOSPITAL
• NEVAEH SUSTAINED PERMANENT NEUROLOGIC INJURIES
NEVAEH HALL : WHAT WENT WRONG ?

• MEDICAL REPORTS INDICATE THAT THE PERMANENT NEUROLOGIC DAMAGE WAS CAUSED BY “SEVERE HYPOXIA”

FACTORS IN NEVAEH HALL INJURY

• FAILURE TO FOLLOW STANDARDS OF CARE AND SAFE PRACTICES
  • NEVAEH WAS GIVEN 5 SEDATIVES. 1 WAS 3 X THE MAX DOSE
  • DDS WAS REPRIMANDED TWICE BY THE STATE DENTAL BOARD
    • 2005 : INADEQUATE RECORD KEEPING
    • 2012: FAILURE TO FOLLOW THE STANDARD OF CARE
  • “ULTIMATELY, IT WAS FOUND THAT JEFFERSON SEVERELY OVERMEDICATED THE CHILD” (HOUSTON PRESS)
FACTORS IN NEVAEH HALL INJURY

• FAILURE TO RECOGNIZE AN EMERGENCY
• NEVAEH BECAME HYPOXIC
  • SEIZURES OCCURRED FAIRLY EARLY IN PROCEDURE
  • NO HELP WAS CALLED
  • SATS OF AS LOW AS 49% SHOWN ON MONITOR RECORDS
• PERIODS OF HYPOXIA FOR OVER 4 HOURS
• PT WAS PUT IN A RECOVERY AREA AND LEFT THERE FOR HOURS WITH NO IMPROVEMENT

NO RESCUE ATTEMPTED AND NO FIRST RESPONDERS CALLED

O2 DISSOCIATION CURVE

AT 85%, SPO2, HG IS 50% SATURATED
YOU ARE MILDLY HYPOXIC AT SPO2% OF 85%!!!
AT 49% SPO2, YOU ARE SEVERELY HYPOXIC
CALEB SEARS (2015)

- Healthy 6 year old boy
- Planned procedure: Extraction of Mesiodens
- Operator: OMFS
- IV placed
  - Propofol, ketamine, fentanyl and midazolam administered IV
- Caleb stopped breathing and was rushed to the hospital (brain dead on arrival)

CALEB SEARS: WHAT WENT WRONG?

- Caleb’s death certificate says he died in the hospital (technically true)
- He was removed from life support 2 days after being rushed to the hospital because he was brain dead on arrival to hospital and neurologists’ consults said he would never wake up
CALEB SEARS: WHAT WENT WRONG?

- Shortly after sedation started, Caleb “stopped breathing”
- An unsuccessful intubation attempt was made by OMFS

FACTORS IN CALEB SEARS DEATH

- Inadequate training?
  - Lack of experience with pediatrics/pediatric airways?
- Inadequate monitoring?
  - Multiple sources state that there was inadequate monitoring
FACTORS IN CALEB SEARS DEATH (CNT’D)

- **FAILURE TO RECOGNIZE AN EMERGENCY**
  - MULTIPLE SOURCES STATE THAT THERE WAS A TIME LAPSE IN RECOGNIZING THAT CALEB HAD STOPPED BREATHING
- **FAILURE TO FOLLOW STANDARDS OF CARE AND SAFE PRACTICES**
  - NECESSARY EMERGENCY MEDS NOT AVAILABLE
  - DELAY IN CALLING 911

WHERE IS THE POSITIVE IN THIS DEATH?

- **CALEB’S LAW (JANUARY 1, 2017)**
  - IT REQUIRES THAT THE DENTAL BOARD OF CALIFORNIA ESTABLISH A COMMITTEE TO STUDY THE SAFETY OF PEDIATRIC ANESTHESIA IN DENTAL OFFICES AND WHETHER ADDITIONAL SAFETY MEASURES WOULD REDUCE THE POTENTIAL FOR INJURY OR DEATH IN MINORS. THESE FINDINGS WILL BE REPORTED TO THE BOARD AND BE MADE PUBLICLY AVAILABLE.
  - IT REQUIRES THAT PEOPLE LICENSED BY THE DENTAL BOARD TO ADMINISTER GENERAL ANESTHESIA INFORM A CHILD’S PARENT OR GUARDIAN OF THE DIFFERING PRACTICE MODELS AND SAFETY PRECAUTIONS CURRENTLY IN PLACE.
  - IT FACILITATES THE EPIDEMIOLOGICAL STUDY OF PEDIATRIC ANESTHESIA AND SEDATION BY REQUIRING THE DENTAL BOARD TO COLLECT MORE INFORMATION REGARDING ADVERSE EVENTS.
- **COULD IT BE BETTER?**
FACTORS IN COMMON

• HYPOXIA (ALL)
• FAILURE TO RESCUE (ALL)
  • FAILED OR DELAYED RECOGNITION OF AN EMERGENCY OCCURRING
• YOUNG AGE (ALL)
• USE OF RESTRAINT THAT MAY FACILITATE OBSTRUCTION (2 CASES)

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