10-Minutes to Save a Life

Stanley F. Malamed
Welcome to the Greater New York Dental Meeting

Greater New York Dental Meeting™
Executive Headquarters
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Sponsored by New York County & Second District Dental Societies

All programs and exhibits are held at the Jacob K. Javits Convention Center (unless otherwise indicated)
11th Avenue between 34th and 39th Street, New York City

General Registration Hours
Friday, November 29 12:00 Noon - 4:30 P.M.
Saturday, November 30 8:00 A.M. - 4:30 P.M.
Sunday, December 1 - Tuesday, December 3 8:00 A.M. - 5:30 P.M.
Wednesday, December 4 8:00 A.M. - 4:30 P.M.

Exhibit Hall Hours
Sunday, December 1 - Tuesday, December 3 9:30 A.M. - 5:30 P.M.
Wednesday, December 4 9:30 A.M. - 5:00 P.M.

COURSE REGISTRATION
Pre-registration is required for all continuing education courses with the exception of the “Live” Dentistry and Affiliated Groups. Your seat will be held for 15 minutes after the start of the course; after that, those without tickets will be seated according to space availability. When the room is filled, no additional people will be admitted due to fire department regulations. If you have not pre-registered, please be prepared to select an alternate session to attend.

Tickets
Tickets are required for all courses excluding Live Dentistry. Tickets for all functions can be purchased at all general registration booths located in the Registration Area on the Upper Level in the Crystal Palace and online.

6 Days of Education Seminars, Hands-on Workshops & Essays
Friday - Wednesday

4 Days of Exhibits
Sunday - Wednesday

FREE “Live” Dentistry Hi-Tech 450 Seat Arena

SUNDAY
9:45 - 11:45
VOCO America, Inc.
Drs. Ron Kaminer & Marc Geissberger
Restorative

9:45 - 11:45
Shofu
Dr. Ron Kaminer
Restorative

11:45 - 1:30
First Fit
Drs. Frederick E. Solomon
Cyrus Tahmasebi
Digital

1:30 - 2:45
Philips Sonicare
Dr. Gerard Kugel
Whitening

2:45 - 4:00
3shape
Dr. Sundeep Rawal
Digital

MONDAY
9:45 - 12:00
Millennium
Dr. Sunil D. Thanik
Laser

1:30 - 2:45
Align I Invisalign I Itero
Drs. Karla Soto & Christian Coachman
Restorative

2:45 - 4:00
First Fit
Drs. Frederick E. Solomon
Cyrus Tahmasebi
Digital

3:00 - 5:15
3Shape
Dr. Sundeep Rawal
Digital

TUESDAY
9:45 - 12:00
Apa / CareCredit
Drs. Michael Apa
Aesthetic

2:00 - 4:15
Glidewell
Dr. Justin Chi
Digital

9:45 - 11:45
Benco / Vatech
Dr. Aeklavya Panjali
Implant

WEDNESDAY
2:00 - 4:15
Celebrity Luncheon Speaker
John Quiñones
Monday, December 2nd
12:00 - 2:00 - Ticket 4010
$125.00

3D Printing & Digital Dentistry Conference
Dental Laboratory Technicians Programs
Sleep Apnea Symposium
Oral Cancer Symposium

Receive a CE passport bundle today!
5th Annual Global Orthodontic Conference
3rd Annual Pediatric Dentistry Summit
12th Annual INVISALIGN® - GNYDM EXPO
4 Days of Programming:
Sunday - Wednesday

WORLD IMPLANT EXPO
Innovation Starts Here

Over 1,700 Exhibit Booths
Medical emergencies CAN and DO happen in the practice of dentistry

4,307 doctors in North America

★ 94.9% have experienced at least one medical emergency in their office
★ Average length of career 14.7 years
★ 30,608 emergencies reported
★ 7.1 emergencies per doctor during career

MALAMED SF, JADA 1993

Stress-Related Emergencies

<table>
<thead>
<tr>
<th>Emergency</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syncope (fainting)</td>
<td>15,407</td>
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<tr>
<td>Mild allergy</td>
<td>2,583</td>
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<tr>
<td>Angina pectoris</td>
<td>2,552</td>
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<tr>
<td>Postural hypotension</td>
<td>2,475</td>
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<tr>
<td>Seizure</td>
<td>1,595</td>
</tr>
<tr>
<td>Asthmatic attack</td>
<td>1,326</td>
</tr>
<tr>
<td>Hyperventilation</td>
<td>1,326</td>
</tr>
<tr>
<td>Epinephrine reaction</td>
<td>913</td>
</tr>
<tr>
<td>Hypoglycemia</td>
<td>890</td>
</tr>
<tr>
<td>Cardiac arrest</td>
<td>331</td>
</tr>
<tr>
<td>Anaphylaxis</td>
<td>304</td>
</tr>
<tr>
<td>Myocardial infarction</td>
<td>289</td>
</tr>
<tr>
<td>L.A. Overdose</td>
<td>204</td>
</tr>
</tbody>
</table>

All ages  N = 4,307

"Try to keep the victim alive until they recover or until another - more qualified - individual assumes responsibility for treatment"
Preparation of the Office & Staff

1. Basic Life Support training
2. Preparation of Dental Office Staff Members
3. Emergency Assistance
4. Emergency Drugs & Equipment

BASIC LIFE SUPPORT
(CPR, Resuscitation, Reanimation)
is THE single-most important step in the management of ALL medical emergencies

Preparation of the Office & Staff

1. Basic Life Support training
2. Preparation of Dental Office Staff Members
3. Emergency Assistance
4. Emergency Drugs & Equipment

The Office Emergency Response Team

Member #1
Member #2
Member #3

Emergency Medical Services

When the DOCTOR or other PERSON IN CHARGE feels it necessary

NEVER HESITATE to seek help if you feel it is needed
1. Basic Life Support training
2. Preparation of Dental Office Staff Members
3. Emergency Assistance
4. Emergency Drugs & Equipment

Critical Drugs & Equipment

THE BASIC EIGHT
(as per Malamed)
1. Epinephrine
2. Histamine-blocker
3. Bronchodilator
4. Nitroglycerin
5. ‘Sugar’
6. Aspirin
7. Naloxone
8. Oxygen

Automated External Defibrillator
(AED)

Sudden Cardiac Arrest

70% of out-of-hospital SCA occur in the HOME of the victim.

As dentists we have TWO homes:

The one in which we live
The one in which we work

P - C - A - B - D

P = Position . . . . . .  Conscious = comfortable; Unconscious = supine
C = Circulation . . . . . Assess & chest compression if needed
A = Airway . . . . . . Assess & maintain airway (head tilt-chin lift) if needed
B = Breathing . . . . . Assess & ventilate if needed
D = Definitive Care . . . Diagnosis, Drugs, Defibrillation
1. Seizures
2. Respiratory Distress
3. Allergy
4. Cardiovascular Disorders
   • Angina Pectoris
   • Myocardial Infarction
   • Cardiac Arrest
   • Defibrillation

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ALTERED CONSCIOUSNESS

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Seizure

Convulsion, ‘Fit’, ‘Spasm’

Definition:
A paroxysmal episode, caused by abnormal electrical conduction in the brain, resulting in the abrupt onset of transient neurologic symptoms such as involuntary muscle movements, sensory disturbances and altered consciousness. Also called convulsion.

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Causes of seizures in the dental environment

Epileptic patients

• Stress induces seizures
• Cerebral hypoxia
• Syncope + inadequate airway
• Hypoglycemia
• Local anesthetic overdose

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Seizures - Dialogue history

• What type of seizure(s) do you have?
• What anticonvulsant medications do you take?

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Grand Mal - French for ‘Great Illness’

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Seizures - Dialogue history

• How well controlled are your seizures?
  Typical = ~5 per year
  Well-controlled
  Poorly controlled
An epileptic aura precedes an epileptic seizure and may involve visual disturbances, dizziness, numbness, or any of a number of sensations which the patient may find difficult to describe exactly.

Generalized tonic clonic seizure
GTCS, ‘Grand Mal’

- Are self-limiting
- (most) SEIZURES STOP
- Last not more than 2 to 5 minutes
- Do NOT require anticonvulsant therapy
- Do NOT result in injury

In a generalized tonic clonic seizure . . .
During the *ictal* phase:
- CNS stimulation **Bad**
- Respiratory stimulation **OK**
- Cardiovascular stimulation **So-So**

Protect victim from injury:
Rescuer 1: arms . . . gently!
Rescuer 2: legs . . . gently!
Rescuer 3: airway
remove “pillow” or “donut” from headrest of chair
↓
Summon EMS ?????

DO NOT PUT ANYTHING INTO THE MOUTH OF A CONVULSING PERSON

Remove “pillow” or “donut” from headrest of chair
Seizure Management

- In a generalized tonic clonic seizure.
- During the "post-ictal" phase:
  - CNS depression: Bad
  - Respiratory depression: Bad
  - Cardiovascular depression: Bad

Post-Ictal Phase

The post-ictal phase is when most morbidity & mortality occur.

CAB as needed
- Airway, if snoring
- Breathing, circulation - usually not necessary
- Patient is disoriented, sleeping

Position: turn on side, if at all possible
- Minimizes risk of aspiration of vomitus
- Aids in airway maintenance,
  Dental chair: turn on side, if at all possible
  - If not: Supine & maintain airway, prn

Why consider EMS?

Sometimes seizures DON’T stop

Status Epilepticus

STATUS EPILEPTICUS is defined as:
A medical emergency characterized by continuous seizures lasting more than 5 minutes without interruption or . . .
A repeated seizure that begins before the individual recovers from the initial episode.
Management of Grand Mal Status

- Terminate dental procedure
- Position patient - supine, feet elevated
- **Activate EMS**
- **Protect patient from injury**
  - BLS, pm
  - Administer oxygen
  - Monitor vital signs

**Venipuncture** (adult or larger child [> 30 kg])
- Anticonvulsant drug - titrated to effect IV
- Administer 50% dextrose
- Definitive management:
  - Stabilize & transport to hospital ED

**Respiratory Distress**

What kind of asthma do you have?
- Allergic . . . non-allergic

**Asthma**

- **Allergic:** What precipitates an acute episode?
  - Aspirin
  - NSAID’s
  - Exercise-induced asthma
  - Sulfites
  - Vasopressor-containing local anesthetics

What drug[s] do you use for an acute episode?
- Your ‘Rescue Drug’
- Beta agonists, such as:
  - **Albuterol** (Salbutamol)
  - **Metaproterenol** (Alupent)

What drug[s] do you use to minimize/prevent acute episodes?
- **Inhaled steroids** (triamcinolone - Azmacort)
- Long-acting beta agonist (salmeterol – Serevent)
Bronchospasm

Asthmatics will usually have their ‘RESCUE DRUG’ with them at all times.

Feeling of chest congestion
Cough: c/s sputum production
Wheezing
Dyspnea
Patient sits up
Use of accessory muscles of respiration
Increased anxiety
Tachypnea

Bronchospasm

P . . .
C . . .
A . . .
B . . .
D . . .

Bronchospasm Management

Administer bronchodilator . . .
episode terminates
Subsequent dental care
Discharge of patient

Status Asthmaticus

Status asthmaticus is an acute exacerbation of asthma that remains unresponsive to initial treatment with bronchodilators.

Summon EMS . . . if
patient requests
or
episode is refractory to
2 doses of bronchodilator

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HYPOXIA
Restlessness, confusion, anxiety
Cyanosis
Diaphoresis (profuse sweating)
Tachycardia, cardiac dysrhythmias
Cardiac and/or renal failure

HYPERCARBIA
Diaphoresis
Hypertension (converting to hypotension, if progressive)
Hyperventilation
Headache
Confusion, somnolence
Cardiac failure

Status Asthmaticus
If EMS delayed, or if situation deteriorates . . .
IM epinephrine q5m
Vastus lateralis 0.3 mg or 0.15 mg of 1:1000
15 - 30 kg = 0.15 mg
>30 kg = 0.3 mg

Vastus Lateralis = Thigh
(1) More vascular
(2) Can self-administer
(3) Anatomically safe

Allergy
Allergy represents an OVERREACTION by the bodies immune system to a foreign substance (allergen)

Histamine
Leukotrienes
Prostaglandins
Thromboxane
Histamine
Pharmacology - Summary
- Itching . . . Pruritis
- Hives . . . Urticaria
- Rash . . . Erythema
- Bronchospasm
- Vasodilation

Onset of S&S

Delayed:
- S & S develop slowly [>60 min]
- Reaction involves skin

Immediate:
- S & S develop within minutes of exposure
- Reaction involves respiratory a/o cardiovascular systems

Progression of S&S

Usual: Starts as SKIN - does not progress
- Stimulation of EXOCRINE GLANDS e.g. tearing, nasal discharge (runny nose)
- Spasm of intestinal smooth muscle (e.g. cramping)
- Bronchospasm
- Vasodilation of blood vessels

Delayed onset skin reaction

Management:
- D . . .
- Parenteral histamine blockers:
  - Diphenhydramine . . . IM (vastus lateralis)
  - 50 mg adults
  - 25 mg (up to 30 kg)

Delayed onset skin reaction

Management:
- D . . .
- Oral histamine blockers:
  - Diphenhydramine
  - 50 mg qid adults
  - 25 mg qid up to 30 kg
  - For 3 days
Anaphylaxis

Definition: An acute and potentially life-threatening multi-system allergic reaction

Respiratory compromise and cardiovascular collapse cause most deaths

- Time to CV collapse: Food (25-35 min); Insect sting (10-15 min)

Anaphylaxis . . . Management

P . . . Based upon primary complaint:
  - “Can’t breathe” . . . upright
  - “Feel faint” . . . supine, feet elevated

C . . . assess . . . prn

A . . . assess . . . prn

B . . . assess . . . prn

Anaphylaxis - a practice parameter update 2015
Lieberman P, Nicklas RA, Randolph C, et al

Prompt recognition of signs and symptoms of anaphylaxis is crucial.

If there is any doubt, it is generally better to administer epinephrine

S&S of Anaphylaxis

<table>
<thead>
<tr>
<th>RESPIRATORY</th>
<th>CUTANEOUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dyspnea, wheeze</td>
<td>&gt; 90%</td>
</tr>
<tr>
<td>Upper airway angioedema</td>
<td>85% - 90%</td>
</tr>
<tr>
<td>Rhinitis</td>
<td>45% - 55%</td>
</tr>
<tr>
<td>Pruritus without rash</td>
<td>2% - 5%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ABDOMINAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nausea, vomiting, diarrhea, cramping pain</td>
</tr>
<tr>
<td>Dizziness, syncope, hypotension</td>
</tr>
</tbody>
</table>

CNS |
Epinephrine and oxygen are the most important therapeutic agents administered in anaphylaxis. Epinephrine is the drug of choice, and the appropriate dose should be administered promptly at the onset of apparent anaphylaxis.

There is no absolute contraindication to epinephrine administration in anaphylaxis.

Anaphylaxis . . . Management

D . . . Definitive care

- Epinephrine
  - As soon as possible
  - Every 5 minutes until
  - Victim recovers
  - Help (9.1.1) arrives

Anaphylaxis: How do patients die?

Vasodilation
Increased vascular permeability may shift 35% - 50% of intravascular volume to the extravascular space within 10 minutes

Results in precipitous drop in BP

Anaphylaxis . . . Management

- Assess C, A, B’s
- Epinephrine 0.3 mg of 1:1,000 IM thigh (adult); 0.15 mg of 1:1,000 IM thigh (child). Give quickly and repeat every 5 minutes as needed
- Give as soon as possible
Position supine, feet elevated. This position is equivalent to infusion 1 - 2 liters in the central vascular compartment.

Anaphylaxis . . . Management (2)

Why epinephrine?
Reverses 2 components of anaphylaxis which lead to death:
- Bronchospasm . . . Epi is bronchodilator
- Hypotension . . . Epi is vasopressor
Epi, through its vasoconstrictive actions can reverse edema, but only if administered PROMPTLY

Works fast
- IM vastus lateralis w/1 ± 2 minutes

Anaphylaxis . . . Management (3)

Oxygen - for patients with prolonged reactions, are short of breath, experiencing chest pain
- Activate EMS

Anaphylaxis . . . Management

Goal: short-term survival
- Epi . . . Epi . . . Epi
- BLS, prn
- Oxygen
- EMS

Recovery:
- Relief of bronchospasm
- Elevation of blood pressure

Anaphylaxis . . . Management

Recovery:
- Epinephrine:
  - Rapid onset - GOOD
  - Short duration - BAD

Anaphylaxis . . . Management

Recovery:
Anaphylaxis . . . Management

Once life is out of danger . . .

**Histamine blocker IM (1 mL)**
- Diphenhydramine HCl 50 mg
  - 25 mg - up to 30 kg

EMS

1. Start an IV line
2. Administer appropriate drugs
   - Epinephrine, histamine blocker, corticosteroid
3. ‘Stabilize and transport’ victim to hospital ED

**Hospitalization**
- ED . . . several hours - observation
- Hospitalized . . . overnight - observation
- Hospitalized . . . several days

Chest ‘Pain’

Coronary Arteries
**MYOCARDIUM**

Blood flows through coronary arteries only during **DIASTOLE**, not systole.

Skeletal muscle extracts **25%** to **30%** of available **O₂** in blood;

Cardiac muscle extracts **60%** to **80%**.

Coronary arteries dilate when myocardial workload increases.

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**Angina Pectoris**

Angina pectoris, commonly known as angina, is the sensation of chest pain, pressure, or squeezing, often due to ischemia of the heart muscle from obstruction or spasm of the coronary arteries.

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**Angina Pectoris**

Anything increasing the workload of the heart can induce an anginal episode.

The 4 E’s of angina:

- Exertion
- Emotion
- Eating
- Extremely cold or hot weather

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**Transient Myocardial Ischemia = Angina Pectoris**

Myocardium not receiving an adequate blood supply becomes ischemic, leading to the onset of anginal 'pain'.

---

**Angina Pectoris . . . Management**

- **P** . . . Conscious = Comfortable (usually upright preferred)
- **C** . . . Assess . . . prn
- **A** . . . Assess . . . prn
- **B** . . . Assess . . . prn
- **D** . . . **Nitroglycerin**, **O₂**
- **D** . . . Determine cause, modify future treatment
Nitroglycerin

Nitroglycerin produces a **28% increase** in coronary artery lumenal diameter.

Consider **Myocardial Infarction**

In **anginal** patient when:
- 'Pain' worse than usual
- 3 doses of nitroglycerin fail to relieve discomfort
- doses every 5 minutes
- Nitroglycerin relieves 'pain', but 'pain' returns.

Consider **Myocardial Infarction**

**ALWAYS** when there is no prior history of cardiovascular disease.

**Infarction**

Obstruction of the blood supply to an organ or region of tissue, typically by a thrombus or embolism, causing **local death** of the tissue.

### Activity Percentage

<table>
<thead>
<tr>
<th>Activity</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>At rest</td>
<td>51</td>
</tr>
<tr>
<td>Modest or usual exertion</td>
<td>18</td>
</tr>
<tr>
<td>Physical exertion</td>
<td>13</td>
</tr>
<tr>
<td>Sleep</td>
<td>8</td>
</tr>
<tr>
<td>During surgical procedure</td>
<td>6</td>
</tr>
<tr>
<td>Other</td>
<td>4</td>
</tr>
</tbody>
</table>
Suspected MI . . . Management

P . . . Conscious = Comfortable (usually upright preferred)
C . . . Assess . . . prn
A . . . Assess . . . prn
B . . . Assess . . . prn
D . . . MONA - Nitroglycerin, O₂

MONA

Morphine
Oxygen
Nitroglycerin
Aspirin

Prehospital management of suspected MI

Aspirin in Myocardial Infarction

- 325 mg. POWDERED, if available, with water
- 20 minute onset
- Prevents blood clot (thrombosis) from increasing in size
- Increases chances of percutaneous coronary intervention being successful

Normal Sinus Rhythm - NSR

Premature Ventricular Complexes

Monomorphic (Unifocal)

ALL PVC’s look alike

Area of ischemic myocardium
Premature Ventricular Complexes

Poly(morphhic (Multi)focal)

PVC’s vary in size & shape

MORE CLINICALLY SIGNIFICANT!

Premature Ventricular Contractions

PVC’s

Patient is CONSCIOUS yet demonstrating S&S of decreased blood flow to periphery:
- Cyanotic mucous membranes
- Ashen gray skin color
- Diaphoresis
- Generalized feeling of fatigue

Acute Myocardial Infarction

Cardiac Arrest

Most OOH-CA are related to acute dysrhythmias (VF/pulseless VT)

Most occur during the 1st hour after symptom onset

52% of MI mortality

Deaths from MI

The significant mortality rate associated with MI is, in part, based on the average delay (4.9 hours) between the onset of signs and symptoms and intervention by the emergency medical system.

CARDIAC ARREST occurs when the heart ceases to PUMP BLOOD

In CARDIAC ARREST the heart, usually, is still BEATING

It is no longer PUMPING

There are 4 rhythms that constitute cardiac arrest

1. (pulseless) Ventricular Tachycardia
2. Ventricular Fibrillation (coarse & fine)
3. Asystole
4. Pulseless Electrical Activity (PEA)
Ventricular Tachycardia degenerates into a chaotic, unorganized quivering of the myocardium - ventricular fibrillation.

Coarse Ventricular Fibrillation

Our goal in resuscitation is to prevent the permanent death of the victim.

- Cells in the victims body will die when they use up all of the O\textsubscript{2} available to them
- Cellular or biological death occurs
- Cellular or biological death is irreversible

Among the most crucial procedures is therapeutic hypothermia. Patients who remain comatose after being in cardiac arrest should be cooled for at least 24 hours to a temperature from 88.6 to 96.8 degrees Fahrenheit, to slow down the metabolic processes that cause cells to die.

Survival to Hospital Discharge

New York City, NY
Survival Rates from SCA

Survival - to hospital discharge - is dependent upon:
✓ Bystander initiated CPR
✓ Time from collapse to defibrillation

Automated External Defibrillators (AED's)

Can the chest be compressed adequately with the victim in the dental chair?

YES

Rules to Remember

The very first step in management of all medical emergencies is BASIC LIFE SUPPORT, as needed

Emergency Management

Drug therapy is ALWAYS secondary to basic life support

P = position
C = circulation
A = airway
B = breathing
D = definitive care

Cardiac arrest

P = position
C = circulation
A = airway
B = breathing
D = defibrillation

Try to keep the victim alive

P - C - A - B - D