Back to the Basics
Do You Remember First Aid?

Guy Peifer
Assessment & The Alphabet

- How many of you think patient assessment is a long and tedious (think torture) process?

- Would you like an easier method?

I CAN'T HEAR YOU!
Assessment & The Alphabet

- Sing with me ......
Assessment & The Alphabet

- A: Airway: Is it open?
- B: Is it clear?
- C: Is the patient maintaining it?
Assessment & The Alphabet

A

Breathing:

Inspect

B

Palpate

C

Auscultate

D

Seal

E

Stabilize

F

Oxygen

G
Assessment & The Alphabet

- A
- B
- C
- D
- E
- F
- G

Circulation: Pulse
Skin
Bleeding
Assessment & The Alphabet

- **A**
  - Decision: High/Low Priority

- **B**
  - Disability: AVPU
    - Pupils
    - Simple Commands

- **C**
  - Diagnostics: Vitals
    - Pulse Oximetry
    - Blood Glucose
    - Pulse Cooximetry
Assessment & The Alphabet

- A
- B
- C
- D
- E
- F
- G

Expose
Examine
Assessment & The Alphabet

- A
- B
- C
- D
- E
- F
- G

Focused Assessment
Focused History
Assessment & The Alphabet

- A
- B
- C
- D
- E
- F
- G

G = GO!

O = Ongoing Assessment
Safe Handling and Use of Oxygen

What Does It All Mean?
Crown Marking Diagram
Medical "E" Cylinder

**DOT-3AL**

The U.S. regulatory authority, the Department of Transportation "DOT", and specification "3AL" to which the cylinder is manufactured in compliance.
Crown Marking Diagram
Medical "E" Cylinder

DOT-3AL2015.MMXXXXXXXX M4002 01*02 CATALINA M24 TC-3ALM139

2015 The service pressure "2015", in pounds per square inch (psi), of the cylinder.
Crown Marking Diagram
Medical "E" Cylinder

DOT-3AL2015. MMXXXXXXXX M4002 01*02 CATALINA M24 @ TC-3ALM139

MMXXXXXXXX The cylinder serial number. The serial number prefix of 'MM' is specific to the 24 cuft 2015 psi medical oxygen cylinder, manufactured at Catalina Cylinders, Garden Grove, California facility, followed by "XXXXXXXX" a seven-digit number.
Crown Marking Diagram
Medical "E" Cylinder

DOT-3AL2015..MMXXXXXXX M4002 01*02 CATALINA M24 ☑ TC-3ALM139

M4002  The DOT Manufacturers Number (M-Number) "M4002" issued to Catalina Cylinders, Garden Grove, California facility.
Crown Marking Diagram
Medical "E" Cylinder

DOT-3AL2015.MMXXXXXXXX M4002 01*02 CATALINA M24 @ TC-3ALM139

01*02 The original hydrostatic test date of the cylinder, month '01', separated by '*' the Independent Inspection Agency (IIA) symbol, followed by the year '02', performed at the time of manufacture of the cylinder. The '*' represents the symbol of the Independent Inspection Agency (IIA) performing the inspection of and certifying the acceptance of the cylinder at the time of manufacture.

Aluminum cylinders are certified for 5 years
Crown Marking Diagram
Medical "E" Cylinder

<table>
<thead>
<tr>
<th>CATALINA</th>
<th>The name of the manufacturer of the cylinder.</th>
</tr>
</thead>
<tbody>
<tr>
<td>M24</td>
<td>The cylinder identifier. Identifies the cylinder is designed for medical service 'M' with a capacity of 24 cu ft &quot;24&quot; of oxygen, hence M24.</td>
</tr>
<tr>
<td>☀️</td>
<td>Actually an &quot;O&quot; with a &quot;2&quot; inside the &quot;O&quot;. This signifies that the cylinder is for oxygen service and the lot of cylinders was subjected to residual hydrocarbon testing.</td>
</tr>
</tbody>
</table>
Crown Marking Diagram
Medical "E" Cylinder

DOT-3AL2015..MMXXXXXXXX M4002 01*02 CATALINA M24 TC-3ALM139

TC-3ALM
The Canadian regulatory authority, Transport Canada "TC" and specification "3ALM" to which the cylinder is manufactured in compliance.

139
The service pressure "139" (in bars) of the cylinder.
Crown Marking Diagram
Medical "E" Cylinder

Additional markings found only on steel cylinders:

+ “Plus” after the date indicates that the cylinder is certified to be overfilled by 10%

★ “Star” after the date indicates that the cylinder is certified for 10 years
Pressure Relief Device

Located on the valve stem opposite the oxygen port:
Oxygen

Pin Index Safety System for Medical Gas Cylinders

<table>
<thead>
<tr>
<th>Gas</th>
<th>Index Pins</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air</td>
<td>1 &amp; 5</td>
</tr>
<tr>
<td>CO2 Mix (CO2&lt;7%)</td>
<td>2 &amp; 6</td>
</tr>
<tr>
<td>CO2 Mix (CO2&gt;7%)</td>
<td>1 &amp; 6</td>
</tr>
<tr>
<td>Cyclopropane</td>
<td>3 &amp; 6</td>
</tr>
<tr>
<td>Ethylene</td>
<td>1 &amp; 3</td>
</tr>
<tr>
<td>He-O2 (&lt;80%)</td>
<td>2 &amp; 4</td>
</tr>
<tr>
<td>He-O2 (&gt;80%)</td>
<td>4 &amp; 6</td>
</tr>
<tr>
<td>Nitrous Oxide</td>
<td>3 &amp; 5</td>
</tr>
<tr>
<td>Oxygen</td>
<td>2 &amp; 5</td>
</tr>
</tbody>
</table>
DISS
(Diameter Index Safety System)
- Used on cylinders larger than E
Sealing Washer

Metal-bound elastomeric
Designed for multiple use applications

*Buna N*: Standard Nitrile is also known as Buna-N. Excellent resistance to petroleum-based oils and fuels, water and alcohols. Nitrile also has good resistance to acids and bases, except those with a strong oxidizing effect.
Crush Gasket

Plastic (usually Nylon ®)
Suitable for single use applications.

Crush Gaskets

Grey Nylon  Yellow Nylon  Blue Nylon  Polyethylene (Reported to be)
Assembling Oxygen Regulator

- Tighten T-screw HAND TIGHT
Part 800.24(b)

3. portable oxygen with a minimum 350 liter capacity (medical "D" size) with pressure gauge, regulator and flow meter and one spare cylinder, medical "D" size or larger. The oxygen cylinders must contain a minimum of 1000 PSI pressure;
An adequate supply of oxygen must be available at the beginning and at all times during a shift or ambulance call. To meet the requirements of 800.24.b, the Department will accept a minimum of 2,000 psi in any combination of portable cylinders (eg. 1 @ 1700 and 1 @ 700) on a vehicle at the beginning of the shift.
One portable cylinder must contain at least 500 psi at any time. A vehicle with less than 500 psi in one portable cylinder must be considered out of service until restocked.

An ‘installed’ cylinder (H, K, Q, etc.) must contain at least 500 psi.
So What Is The Minimum?

Absolute minimum safe residual pressure

- 200 psi
- **NEVER** let cylinder go completely empty
  - INCLUDING IN THE CLASSROOM SETTING
Bandaging Basics

So You Think Can Bandage?
The objective in bandaging is to control bleeding and prevent contamination.

Dressings
- should be sterile
- should cover the entire wound

Bandages
- hold dressings (and splints) in place
- should be clean or sterile
- should cover of the entire dressing
They’re Back !!!

[Diagram of a device with labels: Windlass Strap, Self-Adhering band, Windlass Rod, Windlass Clip, Pull, Release]
Spiral Bandage

Hold the bandage so that it rolls off around the limb; Anchor at tapered area of limb.

Open Spiral to hold the dressing quickly.
Create two tails by doubling the bandage back
Spiral Bandage

Tie-off; always double knot – no bows.
Recurrent Turn

Drape the bandage over the center of the dressing.
Recurrent Turn

Continue draping while fanning out to both sides.
Recurrent Turn

Use a spiral to secure and close the bandage.
Recurrent Turn

Tie off on the limb.
So…. Can You Fold a Triangle Bandage into a Cravat
How Many of You Do This?
Or This?
Let’s Try This

The images show a demonstration of folding a cravat. Initially, it is folded to provide a 3 inch wide cravat. By opening one fold, it becomes a 6 inch wide cravat. This provides a simple visual guide to understanding the effect of folding and unfolding on the width of the cravat.
Surgeon’s Knot

Start with a simple knot. Pass the end through a second time.

The double twist adds friction to the knot. This allows you to let go to get a better grip to gently tighten the knot. It still requires a second knot to be secured.
Can You Use a Cravat to Bandage a Wound?
3 inch Cravat Bandage for Forearm

Place cravat diagonally
3 inch Cravat Bandage for Forearm

Wrap tails – one distal, one proximal to cover the dressing
3 inch Cravat Bandage for Forearm

Tie-off over the wound
How About a Head Wound?

How would you guys handle a laceration to the top of the scalp?
Triangle Bandage for Scalp

Fold the base up 1-2” to create a faux-bandage; position just above the eyebrows
Triangle Bandage for Scalp

Cross the tails below the oxiput and tie-off on the forehead; Tuck the ends in (or cut them off)
Triangle Bandage for Scalp

Holding the faux-bandage, gently pull the apex to take up the slack and apply gentle pressure to the dressing; tuck in the end.
Pressure bandage for palm (or amputated limb)
Pressure bandage for palm

Place dressing over wound; have patient grasp bulky padding
Pressure bandage for palm

Place center of cravat over wrist
Pressure bandage for palm

Cross tails on back of hand:
Tail from pinky side covers index and middle fingers;
Tail from thumb side covers pinky and ring finger
Pressure bandage for palm

Cross tails over palm, pull snug to hold pressure. Keep the thumb free.
Pressure bandage for palm

Cross around back of wrist and tie-off over wrist
Open triangle for burned hand
Open triangle for burned hand

Dress hand with moist dressings between fingers
Open triangle for burned hand

Wrap with burn sheet or MTD
Open triangle for burned hand

Place hand with tip of fingers at mid-point of triangle
Open triangle for burned hand

Fold up apex to the wrist
Open triangle for burned hand

Draw tails loosely around, then tie-off over the wrist
4-tail bandage for shoulder/hip
4-tail bandage for shoulder/hip

Lay out one triangle to be folded into a cravat, then lay second triangle with apex approx. in center of first
4-tail bandage for shoulder/hip

Fold first triangle into a cravat (1st fold)
4-tail bandage for shoulder/hip

Fold first triangle into a cravat (2nd fold)
4-tail bandage for shoulder/hip

Fold first triangle into a cravat (3rd fold)
This locks the second triangle in place
4-tail bandage for shoulder/hip

Have your partner hold a dressing over the wound. Place the cravat portion at the nape of the neck (do not flip over).
4-tail bandage for shoulder/hip

Secure under the opposite arm.
4-tail bandage for shoulder/hip

Elevate the patient’s arm. Using the exposed portion of the triangle to hold the dressing, fold up approx. 2 inches of the base to create a faux-bandage.
4-tail bandage for shoulder/hip

Draw up any slack
4-tail bandage for shoulder/hip

Cross the tails under the arm (no knot), bring them around along the fold and tie on the outside.
4-tail bandage for shoulder/hip

Lower the patient’s arm to take up remaining slack and apply pressure to the wound
The same bandage can be used for the hip, but requires more bulky dressing to hold pressure on the wound.
Splinting
Back to Basics
The objective in splinting is to immobilize the injury and the two adjacent joints.

Rigid splints must be padded
- Most commercially available splints are pre-padded

Voids between the splint and the limb should be filled to provide additional support
- Fill voids prior to securing the splint

Cravats should generally be applied proximal to distal to prevent the splint from becoming too tight
- The operative word is “snug”
Upper Extremity Splinting

Generally, one splint is adequate and more comfortable for the patient. A second splint tends to be cumbersome and uncomfortable.

For upper extremities, if the splint is too long, it should extend distally.

> A forearm splint that extends past the elbow will become problematic when applying a sling and transporting through doorways.

> A humerus splint that extends past the shoulder will become problematic placing the patient on a stretcher.
Lower Extremity Splinting

Generally, two splints are desirable because the bones tend to be larger, requiring greater support.

For lower extremities, if the splint is too long, it should extend proximally.

> Splints that extend more than a few inches past the foot become problematic during transport.
Sling and Swathe
Full Arm Sling

Lay open triangle against patient’s chest with the upper tail over the shoulder of the un-injured side and apex at the elbow of the injured side.

Knot in apex to cup elbow optional
Bring the lower tail over the shoulder of the injured arm, take in any slack, and tie-off on the un-injured side (knot should never be on the spine)

If no knot, use safety pin to cup elbow
Modified Sling and Swathe for Clavicle or Shoulder
Modified sling for clavicle/shoulder

Bring the lower tail *under* the arm and across the back, and tie-off on the un-injured side
Swathe

Using a wide cravat, start with the center of the swathe on the distal 1/3 of the humerus of the injured arm and draw the tails to the opposite side. Tie off under the arm.
Swathe

Options include a second swathe placed mid-shaft, and/or using narrow (3") cravats.
Wide Cravat and Swathe for Clavicle or Shoulder
Wide cravat for clavicle/shoulder

Using a wide cravat, cup the elbow in the center and support the forearm, tie at the neck

Finish with swathes
Wrist Sling for Upper Arm
Wrist sling for upper arm

Center a narrow cravat at the wrist, twist the tails and tie off at the neck on the un-injured side.
Forearm Splint
Forearm Splint

Bring arm into sling position; Check perfusion, motor and sensory function while assistant stabilizes the injury.
Have assistant hold splint in position. Use roller bandage or bulky dressing to maintain position of function.
“Position of function” is a *natural, relaxed position* of the hand – as if resting on a grapefruit.

The patient should NOT be instructed to grasp or hold the padding as this creates an unnatural position and puts stress on the injury site by using muscles attached to the broken bone.
Start with center of cravat on the splint, 2-3” above injury. Wrap both tails snug and tie off on the splint.
Secure next cravat 2-3” below injury. Then secure hand to splint. This immobilizes the injury site and one adjacent joint (the wrist).
Option: Use one cravat to secure below the injury and the hand
Apply a sling to immobilize the other adjacent joint (the elbow). Because the injury is distal to the elbow, it should be elevated (no more than 45°). A swathe may provide additional support.
Forearm Splint

Check perfusion, motor and sensory function.
A-frame for Elbow
A-frame for Elbow

Check perfusion, motor and sensory function while assistant stabilizes the injury.
A-frame for Elbow

Prepare the splint, padded side down, with 2 cravats centered on the splint.
A-frame for Elbow

Position the splint so that it contacts the arm as close to the shoulder and wrist as possible.

*Note: All tails are inside*
While your assistant stabilizes the splint and arm, bring the tails of the cravat closest to the shoulder snug around the arm and tie-off on the splint.
A-frame for Elbow

While your assistant continues to stabilize the splint and arm, secure the other cravat the same way. Your assistant should also ensure that the knots do not slip off the ends of the splint.
Tie the two sets of tails together to prevent them from slipping off the ends of the splint.
A-frame for Elbow

Secure the arm using a wrist sling and swathe. Ensure that the swathe is on the distal 1/3 of the humerus without aggravating the injury.
A-frame for Elbow

Check perfusion, motor and sensory function.
A-frame for Knee
Remove the shoe and sock. Check perfusion, motor and sensory function while assistant stabilizes the injury.
A-frame for Knee

With the patient supine, sandwich the leg between 2 medium board splints, positioned as close to the hip and ankle as possible.
A-frame for Knee

Tie the boards together in the center (behind the knee) with one cravat
A-frame for Knee

Tie the boards together over the thigh.
A-frame for Knee

Tie the boards together over the shin.
A-frame for Knee

Secure the foot to immobilize the ankle.
A-frame for Knee

Check perfusion, motor and sensory function.
Tib/Fib Splint
Tib/Fib Splint

Remove the shoe and sock. Check perfusion, motor and sensory function while assistant stabilizes the injury.
Tib/Fib Splint

Have your assistant maintain stabilization of the injured leg by supporting the splints. Fill any voids with dressings or other padding as necessary.
Tib/Fib Splint

Secure the foot and ankle last.
Position the center of the cravat at the heel.
Bring the tails around the splints and cross below the foot.
Tib/Fib Splint

Bring the tails around the foot and tie-off on the bottom of the foot.
Tib/Fib Splint

Check perfusion, motor and sensory function.
Questions?  Comments?

Discussion?