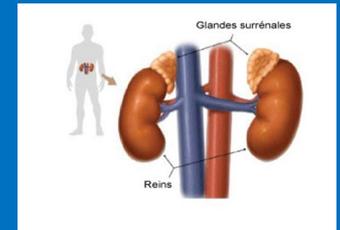




Staying Well and Avoiding Adrenal Crisis: The Pediatric Perspective



Cheri Deal, PhD, MD

Emeritus Professor, Université de Montréal

Pediatric Endocrinologist, ELNA Tiny Tots, Montréal

Associate Investigator, Research Center Mother-Child University

Hospital Sainte-Justine

Declaration

- I have no conflicts of interest pertaining to this talk or to my participation in the conference
- I encourage you to share this talk and that of my colleagues with your treating physicians



How Do We Treat an Adrenal Crisis

Rule #1: (Benjamin Franklin)

**“An ounce of prevention ...
is worth a pound of cure”**



Prevention: Solutions and Tips

- Follow the treatment plan: Hydrocortisone (Cortef[®])
Fludrocortisone (Florinef[®]), Salt
- Make sure that your prescription gives you enough hydrocortisone tablets to cover stress dosing
- Beware of gastroenteritis: hand wash often, attention when traveling in countries where food contamination is a possibility
- Travel kit: up to date Solu-Cortef vials, salt tablets, glucose gel, oral antibiotics sometimes wise to obtain
- When traveling for longer vacations, try and obtain a medical contact abroad
- Know the rules for stress-dosing and have your kit

How Do We Stress Dose in Kids?

Rule #2: Define the level of stress, and know when to seek medical attention



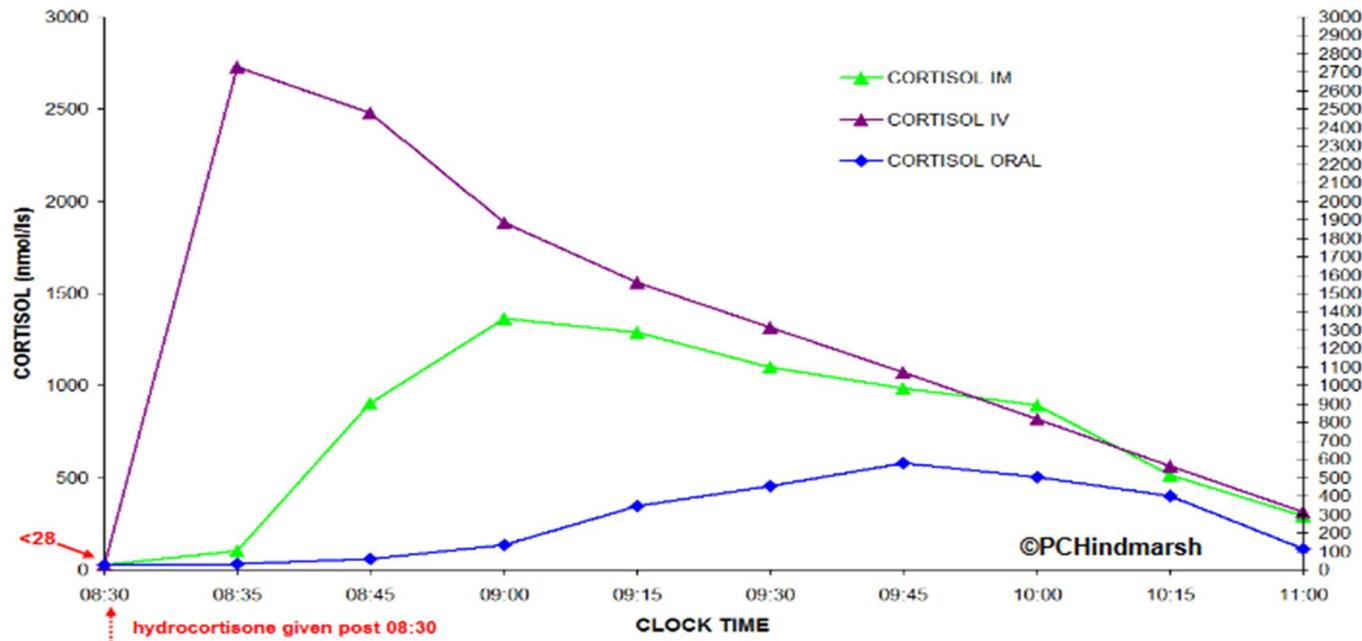
When to Stress Dose

- Fever* **Level 1 stress** ($\geq 38^{\circ}\text{C}$, 100.5°F under tongue)
 - Give 2 times the usual dose, until 24 h without fever
- Fever* **Level 2 stress** ($\geq 39^{\circ}\text{C}$, 102.0°F under tongue)
 - Give 3 times the usual dose, until 24 h without fever
- Loss of fluids when we can't replace them **Level 2 stress**
 - Diarrhea, vomiting, baby or child with signs of hypoglycemia (nausea, lethargy, pallor, jitteriness/tremors)
- Major stress – **Level 3 stress**
 - Loss of consciousness, convulsion
 - Severe infections, multiple trauma, major burns, fractures
 - Anesthesia and surgery
- What is not considered stress
 - School examinations, job interviews, emotional upset

*An ear or rectal temperature is 0.5°F (0.3°C) to 1°F (0.6°C) **higher** than an oral temperature
An armpit temperature is often 0.5°F (0.3°C) to 1°F (0.6°C) **lower** than an oral temperature

What Do We Do When There is No Improvement in Symptoms/Loss of Consciousness?

Rule #3: Administer intra-muscular (I.M.) hydrocortisone (Solu-Cortef®)



Prepare for Injection

PREPARATION SOLUCORTEF® I.M

Act-O-Vial® 100 mg / 2 ml 0.5 ml = 25 mg (yellow stopper)

1.0 ml = 50 mg (yellow stopper)

2.0 ml = 100 mg (yellow stopper)

Act-O-Vial® 250 mg / 2 ml 0.8 ml = 100 mg (red stopper)



Material : -vial (make sure not past expiry date)

-3 ml sterile syringe

-#23 - #25 G; ½ - 5/8 inch (infants 1-36 months)

-#23 G; 5/8 -1-inch sterile needle (3 to 10 years)

-#23 G; 1 inch sterile needle as of pre-teens and above

-alcohol wipes

-band aide as needed



I.M. Solu-Cortef: How Much, Where?

- < 3 years 25 mg
- 3 years to < 10 years 50 mg
- 10 years and older 100 mg



- Instructions come with product so re-read them periodically and practice with expired Act-0-Vials
- Request your healthcare professional for yearly teaching
- Make sure those having the care of your child also have Solu-Cortef on hand and refer them to videos available on-line (preparation and injection technique):
<https://m.youtube.com/watch?v=m0Sz5ZoTJFE>

DIRECTIONS FOR USING THE ACT-O-VIAL SYSTEM

1. Press down on plastic activator to force diluent into the lower compartment.



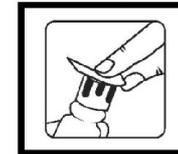
2. Gently agitate to effect solution.



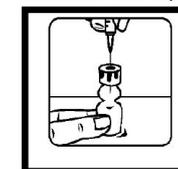
3. Remove plastic tab covering center of stopper.



4. Sterilize top of stopper with a suitable germicide.



5. Insert needle squarely through center of stopper until tip is just visible.



6. Invert vial and withdraw dose.



When Parents and Family Need to be Proactive

Rule #4: Know how to interact with Paramedics and with the Hospital Emergency Department



IMPORTANT MEDICAL INFORMATION
ADRENAL CRISIS



This patient needs daily replacement therapy with hydrocortisone.

IN CASE OF SERIOUS ILLNESS, TRAUMA, COMA, VOMITING OR DIARRHEA, ADMINISTER HYDROCORTISONE

< 3 years	25 mg (IV, IM, IO, SC)
3 - < 10 years	50 mg (IV, IM, IO, SC)
10 years and older	100 mg (IV, IM, IO, SC)

AND IV SALINE INFUSION WITHOUT DELAY

NAME: _____

DATE OF BIRTH: _____

The Canadian Society of Endocrinology and Metabolism
Canadian Pediatric Endocrine Group
Courtesy of The Canadian Addison Society



Calling 911: Must Know

- **FIRST:** give I.M. Solu-Cortef® then call
- Use the appropriate terms:
 - Acute adrenal failure, Adrenal Crisis, Addisonian Crisis because of Addison Disease
- Have your child's one-page treatment plan and your medical kit prepared
- Bring all the child's usual medications





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Rule#6: Remember: All Glucocorticoids Are Not The Same

Liu et al, Allergy, Asthma and Clinical Immunology; 2013

1st choice
po, im, iv

2nd choice po
2nd choice im

	Approximate equivalent dose* (mg)	Relative glucocorticoid activity	Relative mineralocorticoid activity	Duration of action (hours)
Glucocorticoids				
<i>Short-acting</i>				
Hydrocortisone	20	1	1	8-12
Cortisone	25	0.8	0.8	8-12
<i>Intermediate-acting</i>				
Prednisone	5	4	0.8	12-36
Prednisolone	5	4	0.8	12-36
Methylprednisolone	4	5	Minimal	12-36
Triamcinolone	4	5	0	12-36
<i>Long-acting</i>				
Dexamethasone	0.75	30	Minimal	36-72
Betamethasone	0.6	30	Negligible	36-72
Mineralocorticoids				
Fludrocortisone	**	10-15	125-150	12-36

Glucocorticoid doses that provide mineralocorticoid activity = 0.1 mg fludrocortisone:
Hydrocortisone 20 mg
Prednisolone or Prednisone 50 mg

Table adapted from NICE, 2012; Furst et al, 2012

* Equivalent dose shown for oral or I.V. administration

Questions you may wish to discuss with the panel...

- What is the most important counsel we give parents during the transition from pediatric to adult care?
- Are there other stress hormones that we need to replace?
- Why are there often medication shortages (Solu-Cortef[®] Cortef[®] Rocaltrol[®] etc)
- Are APS-1 children that also have hypoparathyroidism or that also have diabetes more at risk for adrenal crisis?
- Anything else?



Merci Thank-you!

New Acute Care Center

New and Old Research Center

Cancer Pavilion



Université de Montréal

