


PEDIATRIC HOSPITAL MEDICINE

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WHAT'S IT ALL ABOUT
HOW TO THINK ABOUT IT AND WHAT TO DO
COMMON AND SOME UNUSUAL CASES



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MYSTERY OF LIFE

WHY DOES SOUR CREAM HAVE AN EXPIRATION DATE ?

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MOST COMMON PEDIATRIC ADMISSIONS

2 MILLION NONBIRTH PEDIATRIC HOSPITALIZATIONS ANNUALLY IN THE US (JAMA PEDIATRIC, MARCH 2022)

THINGS HAVE CHANGED DRAMATICALLY SINCE COVID

56% DECLINE IN PEDIATRIC HOSPITALIZATIONS DURING COVID (2020)

Diagnosis	No. of hospitalizations				Color
	Total	Top hospitals (top 100)	Urban teaching hospitals (top 100)	Urban teaching hospitals (top 100)	
Acute otitis media	101,000	22,000	11,000	11,000	Blue 1-11
Pharyngitis	60,700	10,000	5,000	5,000	Blue 12-11
Diarrhea	59,200	4,000	2,000	2,000	Blue 12-11
Upper respiratory tract infection	73,100	3,000	1,500	1,500	Blue 12-11
Conjunctivitis	42,700	3,000	1,500	1,500	Blue 12-11
Acute otitis media with effusion	40,100	2,000	1,000	1,000	Blue 12-11
Acute otitis media with effusion	39,400	2,000	1,000	1,000	Blue 12-11
Acute otitis media with effusion	38,700	2,000	1,000	1,000	Blue 12-11
Acute otitis media with effusion	38,000	2,000	1,000	1,000	Blue 12-11
Acute otitis media with effusion	37,300	2,000	1,000	1,000	Blue 12-11
Acute otitis media with effusion	36,600	2,000	1,000	1,000	Blue 12-11
Acute otitis media with effusion	35,900	2,000	1,000	1,000	Blue 12-11
Acute otitis media with effusion	35,200	2,000	1,000	1,000	Blue 12-11
Acute otitis media with effusion	34,500	2,000	1,000	1,000	Blue 12-11
Acute otitis media with effusion	33,800	2,000	1,000	1,000	Blue 12-11
Acute otitis media with effusion	33,100	2,000	1,000	1,000	Blue 12-11
Acute otitis media with effusion	32,400	2,000	1,000	1,000	Blue 12-11
Acute otitis media with effusion	31,700	2,000	1,000	1,000	Blue 12-11
Acute otitis media with effusion	31,000	2,000	1,000	1,000	Blue 12-11
Acute otitis media with effusion	30,300	2,000	1,000	1,000	Blue 12-11
Acute otitis media with effusion	29,600	2,000	1,000	1,000	Blue 12-11
Acute otitis media with effusion	28,900	2,000	1,000	1,000	Blue 12-11
Acute otitis media with effusion	28,200	2,000	1,000	1,000	Blue 12-11
Acute otitis media with effusion	27,500	2,000	1,000	1,000	Blue 12-11
Acute otitis media with effusion	26,800	2,000	1,000	1,000	Blue 12-11
Acute otitis media with effusion	26,100	2,000	1,000	1,000	Blue 12-11
Acute otitis media with effusion	25,400	2,000	1,000	1,000	Blue 12-11
Acute otitis media with effusion	24,700	2,000	1,000	1,000	Blue 12-11
Acute otitis media with effusion	24,000	2,000	1,000	1,000	Blue 12-11
Acute otitis media with effusion	23,300	2,000	1,000	1,000	Blue 12-11
Acute otitis media with effusion	22,600	2,000	1,000	1,000	Blue 12-11
Acute otitis media with effusion	21,900	2,000	1,000	1,000	Blue 12-11
Acute otitis media with effusion	21,200	2,000	1,000	1,000	Blue 12-11
Acute otitis media with effusion	20,500	2,000	1,000	1,000	Blue 12-11
Acute otitis media with effusion	19,800	2,000	1,000	1,000	Blue 12-11
Acute otitis media with effusion	19,100	2,000	1,000	1,000	Blue 12-11
Acute otitis media with effusion	18,400	2,000	1,000	1,000	Blue 12-11
Acute otitis media with effusion	17,700	2,000	1,000	1,000	Blue 12-11
Acute otitis media with effusion	17,000	2,000	1,000	1,000	Blue 12-11
Acute otitis media with effusion	16,300	2,000	1,000	1,000	Blue 12-11
Acute otitis media with effusion	15,600	2,000	1,000	1,000	Blue 12-11
Acute otitis media with effusion	14,900	2,000	1,000	1,000	Blue 12-11
Acute otitis media with effusion	14,200	2,000	1,000	1,000	Blue 12-11
Acute otitis media with effusion	13,500	2,000	1,000	1,000	Blue 12-11
Acute otitis media with effusion	12,800	2,000	1,000	1,000	Blue 12-11
Acute otitis media with effusion	12,100	2,000	1,000	1,000	Blue 12-11
Acute otitis media with effusion	11,400	2,000	1,000	1,000	Blue 12-11
Acute otitis media with effusion	10,700	2,000	1,000	1,000	Blue 12-11
Acute otitis media with effusion	10,000	2,000	1,000	1,000	Blue 12-11

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PEDIATRIC CONSIDERATIONS

UNIQUE EPIDEMIOLOGY OF CHILD-SPECIFIC CONDITIONS

PATHOPHYSIOLOGY AND DIFFERENTIAL DX DIFFERS BASED ON AGE

WEIGHT AND AGE BASED DOSING

CHALLENGING MEDICAL HISTORIES AND EXAMS

FAMILY CENTERED MANAGEMENT

VULNERABLE POPULATION (ABUSE RISK)

NORMALCY BIAS- MOST OF THE TIME THEY ARE FINE BUT SOMETIMES THEY HARBOR LIFE-THREATENING CONDITIONS



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SCHOOLMYKIDS
PARENTING, REVISIT, SCHOOLS

STAGES OF CHILD DEVELOPMENT

What are the 5 stages of Child Development?

preterm newborn infants (0 to 28 days)
term newborn infants (0 to 28 days)
infants and toddlers (> 28 days to 23 months)
children (2 to 11 years)
adolescents (12 to 18 years)

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EXAM TRICKS

OBSERVE WHAT YOU CAN FROM A DISTANCE (FRONT DOOR ASSESSMENT)


UTILIZE PARENTS (ON PARENTS LAP, A HUG TO HOLD)

DISTRACTION

EXAMINATION GAMES (FOLLOW THE TOY, GOOF AROUND, SMILE A BUNCH)

TIME AND PATIENCE, SEVERAL REASSESSMENTS CAN TELL A LOT (IS THAT BILLY TENDER OR DOES THAT TODDLER JUST NOT LIKE STRANGERS)


IN GENERAL SIT DOWN WHEN YOU CAN



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WINNING WITH CHILDREN

- TALK TO THE CHILD AND OBTAIN HISTORY FROM THEM IF POSSIBLE
- KNOW THEIR NAME
- MAKE EYE CONTACT
- EXPLAIN WHAT YOU ARE EXAMINING AND WHY
- ASK PERMISSION TO EXAMINE THEM WHEN APPROPRIATE (NOT TODDLERS)
- REMEMBER TODDLERS WILL DISLIKE YOU IN GENERAL
- REMEMBER THAT ADOLESCENCE IS HARD FOR THEM TOO
- DON'T TAKE IT PERSONALLY



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ASK THEM WHAT THEY ARE SCARED OF IN THE HOSPITAL



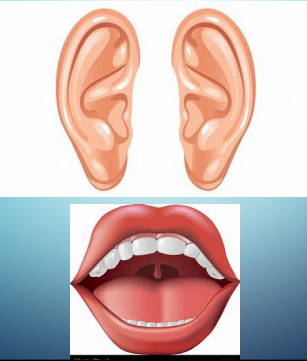
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WINNING WITH PARENTS



- ADDRESS THEIR CONCERNS- LISTEN AND ASK ABOUT THEIR FEARS
- EMPATHIZE
- ALIGN AS ALLIES WITH A COMMON GOAL (WE ARE A TEAM)
- DETAIL VERBALLY YOUR EXAM FINDINGS AS YOU ARE EXAMINING
- REASSESS THE CHILD AND UPDATE FAMILY ABOUT RESULTS AND/OR DELAYS
- EDUCATE


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WINNING THE DIAGNOSIS

- GENERATE DIFFERENTIAL DIAGNOSIS BASED ON AGE AND CHRONIC DISEASE
- CONSIDER THE MOST SERIOUS POSSIBLE DIAGNOSIS AND IS IT LIKELY
- REASSESSMENT- TIME DECLARES MANY ILLNESSES (APPENDICITIS, MENINGITIS, NECROTIZING SOFT TISSUE INFECTIONS)
- REVALUATE ALL STATUS CHANGES- ESPECIALLY THOSE REQUESTED BY NURSING AND FAMILY



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THE DOCTOR'S DILEMMA

THERE IS SOMETHING PARADOXICALLY REASSURING ABOUT SHOCK, CYANOSIS, SEPSIS, FEVER AND THE ACUTE ABDOMEN: WE HAVE A PATHWAY AND A PLAN

IN PEDS, HOWEVER, OFTEN THE MOST NERVE-WRACKING PRESENTATIONS ARE THOSE WHERE THERE IS NO CLEAR PATH, NO CLEAR PLAN, AND YET THE CHILD MAY BE IN DANGER (SCARY)

THESE ARE MOST CHALLENGING



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MYSTERY OF LIFE

WHY DO KAMIKAZE PILOTS WEAR HELMETS ?

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SPEAKING OF THE UNKNOWN

WHAT ABOUT BRUE (BRIEF RESOLVED UNEXPLAINED EVENT) FORMERLY CALLED ALTE (APPARENT LIFE-THREATENING EVENT)


A TRANSIENT EVENT OF UNKNOWN ORIGIN WITH NO REMAINING SYMPTOMS
BRUE IS A GENERALLY REASSURING CATEGORY OF EPISODES MEETING CERTAIN CRITERIA

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DEFINING BRUE

<1 YEAR OLD AND SUDDEN, BRIEF, NOW RESOLVED EPISODE WITH 1 OR MORE:

- CYANOSIS OR PALOR
- ABSENT, DECREASED OR IRREGULAR BREATHING
- MARKED CHANGE TO TONE (HYPER OR HYPO)
- ALTERED LEVEL OF RESPONSIVENESS
- LASTS 20-30 SECONDS USUALLY
- BECOMING FLUSHED OR RED DOESN'T COUNT (THAT'S NORMAL)
- EPISODE IS OVER BY TIME OF EXAMINATION



HIGH RISK ISSUES- ADMIT WITH FURTHER WORK UP
LOW RISK ISSUES (NO RED FLAGS)- OBSERVE OR SEND HOME AFTER 1-4 HOURS

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FEVER IN NEONATES AND YOUNG INFANTS

FEVER IS A RECTAL TEMP 100.4F (38C) OR HIGHER

FEVER IS THE #1 REASON FOR KIDS ED VISIT (30%)

FEVER FACTS: DOESN'T CAUSE BRAIN DAMAGE, IT'S A GOOD THING, DON'T HURT


FEVER IN THE 1ST 2 MONTHS OF LIFE ARE PRESUMED BACTERIAL

12.8% INCIDENCE OF SERIOUS BACTERIAL INFECTIONS

7.6% UTI (PYELO), 1.5% BACTEREMIA, 0.6% MENINGITIS (J PED, JAN 2019)

WELL APPEARING VS ILL APPEARING (MOST ARE WELL APPEARING)

ALL NEONATES AND INFANTS BETWEEN 0-60 DAYS OLD WITH FEVER NEED IMMEDIATE EVALUATION IN AN ER OR HOSPITAL!!!!!!



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RESOURCE

REFER TO PEDIATRICS

CLINICAL PRACTICE GUIDELINE: EVALUATION AND MANAGEMENT OF WELL-APPEARING FEBRILE INFANTS 8 TO 60 DAYS OLD, PANTELL, R.H., ET AL, PEDIATRICS 8/1/21

SEE HANDOUT SHEET



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HYPERBILIRUBINEMIA (JAUNDICE)

PHYSIOLOGIC DAYS 2-7, BREAST MILK JAUNDICE AFTER THAT

EXPLAIN TO PARENTS

TRANSUCUTANEOUS OR SERUM TOTAL AND DIRECT AT 24 HOURS OF LIFE

UNCONJUGATED USUALLY HIGH, IF CONJUGATED IS HIGH BILIRUBIN CAN'T GET OUT OF THE LIVER AND THIS IS PATHOLOGIC (BILIARY ATRESIA)


RISK FACTORS: ABO INCOMPATIBILITY, POSITIVE DAT, PREMATURITY, SIBLING WITH JAUNDICE

SIMPLE: AAP UPDATED IN 2022 BIITOOOL USE THE APP: PEDITOOLS.ORG

TREATMENT: PHOTOTHERAPY, DOUBLE BANK WITH A BILIBLANKET. CHECK CBC AND RETIC. PHOTOTHERAPY CONVERTS UNCONJUGATED BILI TO WATER-SOLUBLE ISOMER ELIMINATED WITHOUT CONJUGATION

SUNLIGHT DOES NOT WORK

ALL THIS TO AVOID KERNICTERUS



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MYSTERY OF LIFE

WHY DO YOUR FEET SMELL AND YOUR NOSE RUNS ?

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RESPIRATORY INFECTIONS

BRONCHIOLITIS (THE NUMBER ONE REASON FOR PEDIATRIC ADMISSIONS)

GENERALLY NO NEED FOR CXR, LABS, ALBUTEROL, STEROIDS ETC.


RHINOVIRUS AND RSV WITH SOME HUMAN METAPNEUMOVIRUS

CROUP: EASY DIAGNOSIS, GIVE 0.6MG/KG DECADRON

IF NEEDING MORE THAN TWO RACEMIC EPI TREATMENTS FOR STRIDOR ADMIT

BE CAREFUL DIFFERENTIAL DX: BACTERIAL TRACHEITIS (THEY ARE TOXIC AND SICK), RETROPHARYNGEAL ABSCESS (THEY LAY DOWN FOR COMFORT), FOREIGN BODY ASPIRATION, EPIGLOTTITIS (RARE)

MULTIPLE VIRUSES CAN CAUSE IT



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WHEN TO ADMIT FOR RESPIRATORY PROBLEMS

THREE THINGS: HYPOXIA, RESP DISTRESS, DEHYDRATION. ALSO LOW THRESHOLD IN NEONATES/ YOUNG INFANTS, EX-PREMIE, COMORBID CONDITIONS, APNEA

WHILE HOSPITALIZED LOOK AT THE GENERAL APPEARANCE OF THE PATIENT

INFAMOUS STUDY (JAMA, SCHUH, 2014) OXIMETRY FALSELY ELEVATED BY 3% COMPARED TO CONTROL CHILDREN WITH BRONCHIOLITIS AND RESULTED IN EARLIER DISCHARGES.

SAO2 SHOULD BE DE-EMPHASIZED WHEN CHILDREN LOOK OTHERWISE WELL (JAMA PED, BAJAJ, 2/16)



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PNEUMONIA


USUALLY VIRAL (NEJM, JAIN, 2/15) RSV (28%), RHINOVIRUS (27%), BACTERIAL ONLY 15% OF THE TIME. MYCOPLASMA (8%), STREP PNEUMO (4%) BUT WATCH OUT FOR GROUP A STREP (BAD PNEUMONIA WITH PLEURAL EFFUSIONS) AND MRSA (SURVEILLANCE SWAB)

TREATMENT DILEMMA: IF YOU SEE IT, YES TREAT IT

WHAT WILL YOU SEE: OBSCURED CARDIAC MARGINS, BIG WHITE CLOUDS

TREAT WITH WHAT? AMOXICILLIN OR AMPICILLIN NOT CEFTRIAXONE

ADD IN ZITHROMAX FOR PATIENTS AT OR OVER 9 YEARS OLD



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ASTHMA EXACERBATION

MOST COMMON CHRONIC DISEASE OF AMERICAN CHILDREN 7%

WORSE IN URBAN CITIES- SMOG, POLLUTION, NOT SUCH CLEAN AIR

WITH AN EXACERBATION NEW CONCEPTS (HIT IT HARD UP FRONT)

BETA AGONIST (ALBUTEROL) WITH AN ANTICHOLINERGIC (IPRATROPIUM) DUONEB X 3, MAG SULFATE, HIGH DOSE STEROIDS

EVERY 2 HOUR NEBS WITH ALBUTEROL OR CONTINUOUS ALBUTEROL

WAIT FOR THE STEROIDS TO KICK IN

POSITIVE PRESSURE VENTILATION (CPAP-RAM CANNULA OR BIPAP)

DON'T INTUBATE IF YOU DON'T HAVE TO



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MYSTERY OF LIFE

MOST LEMON JUICES ARE MADE WITH ARTIFICIAL INGREDIENTS AND COLOR, SO WHY DO MOST DISH SOAPS SAY "MADE WITH REAL LEMONS" ?

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GI DISORDERS

NEWBORNS TO BABIES WITH BILIOUS VOMITING: ALWAYS GET A KUB

MAJORITATION, MIDGUT VOLVULUS, DUODENAL ATRESIA, FUNCTIONAL OBST.

NON-BILIOUS VOMITING- REFUX (SANDIFERS SYNDROME)

- PROJECTILE (PYLORIC STENOSIS) EASY TO ULTRASOUND

INTUSSUSCEPTION- MOST COMMON CAUSE OF GI OBSTRUCTION AGES 6 MO TO 3 YO, 80% OCCURS BEFORE AGE 2 YO. CAN BE TRICKY 60% BEFORE 1YO, OFTEN WITH JUST IRRITABILITY AND VOMITING. GET AN ULTRASOUND. CRAMPY INTERMITTENT PAIN THEN BETTER. REDUCED WITH AN ENEMA. CURRENT JELLY STOOLS ITS TOO LATE WILL NEED A SURGEON.

GASTROENTERITIS- ZOFRAN IS OUR FRIEND, NO ANTIBIOTICS WITH E. COLI

WHEN TO ADMIT FOR DEHYDRATION, CLINICAL SIGNS: LETHARGIC, DRY MOUTH, COOL HANDS AND FEET. CO2 OF <17, NOT HOW MANY TIME IN THE DAY THEY URINATED (THIS IS A POOR INDICATOR)

ALWAYS BONUS PG 48 17 (2019, 2020)

MAINTENANCE FLUIDS- SECRET FORMULA, YOU WILL LOOK REALLY SMART. SEE HANDOUT SHEET

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MYSTERY OF LIFE

HOW COME ABBREVIATION IS SUCH A LONG WORD AND WHY IS PHONETIC NOT SPELLED WITH AN "F"

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DKA

NEW CONCEPTS FOR TREATMENT FOR **MILD** DKA: PH>7.20 AND CO2>10

NO MORE INSULIN DRIPS. REMOVE PUMPS, SUBCUTANEOUS INSULIN INCLUDING LANTUS (LONG ACTING), AND EVERY HOUR BS CHECKS WITH CORRECTION WITH NOVALOG (SHORT ACTING) EVERY TWO HOURS. DON'T DROP BS > 100MG/DL PER HOUR.

ALWAYS REMEMBER IVF NS OR LR ARE THE 1ST AND BEST TREATMENT, THAT HASN'T CHANGED.

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NEUROLOGIC CONDITIONS

STATUS EPILEPTICUS: ABORT WITH LORAZEPAM, LOAD WITH KEPPRA, CONTINUOUS EEG MONITORING- IF UNAVAILABLE, STABILIZE AND TRANSFER TO A CENTER WITH PEDIATRIC NEUROLOGY.

FEBRILE SEIZURES: 6MO-6YO UP TO 5% OF THE POPULATION

SIMPLE. GENERALIZED TONIC-CLONIC, <1.5 MINUTES, ONE EPISODE IN 24 HOURS. NO WORK UP REQUIRED, JUST LOOK FOR THE SOURCE OF FEVER

COMPLEX. FOCAL SEIZURE ACTIVITY, RECURRENT IN 24 HOURS, >1.5 MINUTES, PERSISTENT ALTERED MENTAL STATUS. REQUIRES WORK UP / HOSPITALIZATION

2 TIMES AS LIKELY TO HAVE ANOTHER ONE.

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KAWASAKI DISEASE

FEVER FOR 5 DAYS OR MORE PLUS 4 OF THE FOLLOWING

- CONJUNCTIVITIS
- MUCOSITIS (**STRAWBERRY TONGUE**, CRACKED LIPS)
- CERVICAL ADENOPATHY
- EXTREMITY CHANGES (EDEMA, EVENTUALLY DESQUAMATION)
- RASH – COMMON AT FIRST FACIAL THEN DIFFUSE

CLINICAL DX (CALL PEDI ID, WE DO ALL THE TIME)

IVIG, HIGH DOSE ASPIRIN AND ECHO (**DILATED CORONARY ARTERIES ARE THE REAL BIG DEAL** **YEP**, PEDI CARDIOLOGY CONSULT)

RECURRENT IS BECOMING WAY MORE COMMON- INFILIXIMAB AND HIGH DOSE STEROIDS

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MYSTERY OF LIFE

WHAT DOES THE GUY
WHO DRIVES THE SNOW
PLOW DRIVE TO WORK ?

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BUNCH OF OTHER STUFF

ABSCESS- LOOK FOR MRSA. INCISION AND DRAINAGE IS MOST IMPORTANT
STOMATITIS- COULD BE ON HAND FOOT AND MOUTH) OR HERPES SIMPLEX
MONO- (EBV) MOST COMMON AGE 5-9 YEARS OLD
TRAUMA / FRACTURES- DON'T BE AFRAID TO CONTROL PAIN WITH MEDS
ABUSE- ALWAYS FILE A 960 EVEN IF YOU ARE UNSURE, CONSULT ABUSE EXPERT
PSYCHIATRIC ADMISSIONS (WAY TOO COMMON NOW), ENSURE SAFETY, SUICIDE
PRECAUTIONS, CONSULT PSYCH. IF OVERDOSE ALWAYS CALL POISON CONTROL




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MYSTERY OF LIFE

IF FAMILY PHYSICIANS PLAY
GOLF, DOES THAT MEAN
PEDIATRICIANS HAVE TO PLAY
MINIATURE GOLF ?

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NOW FOR UNUSUAL CASES
QUICK REVIEW BUT INTERESTING



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3 YEAR OLD WITH BULLOUS
LESIONS



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STEVEN JOHNSON SYNDROME
(SJS)

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6 YEAR OLD WITH FEVER AND
ABDOMINAL PAIN



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PNEUMONIA

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10 YEAR OLD FEMALE ADMITTED
TO THE PICU WITH A WEIRD RASH



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COINING AND CUPPING



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8 YEAR OLD CHILD WITH
PAINLESS WOUNDS



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HMSN-TYPE 2 NEUROPATHY
(CHARCOT-MARIE-TOOTH DISEASE)

SPEAKING OF TOOTH

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