

Appendix I

EXAMPLES OF SIMULATIONS OF THE PATIENT-PHYSICIAN ENCOUNTER

INTRODUCTION

This appendix contains abbreviated examples of different methods of simulating the patient-physician encounter. The paper-and-pencil patient management problem (PMP) presents a brief description of a patient, then offers the user a series of choices. The user rubs out the block accompanying his/her choice(s) to obtain information, which is then used to help in choosing among subsequent choices.

A computerized patient management problem (CPMP) is designed similarly to a paper-and-pencil PMP. The advantages of the CPMP include: 1) more complex branching of the decisionmaking process; 2) immediate feedback to the user; 3) review of previously selected items; 4) easier access to adjunct use of audio/visual materials; and 5) better timing, control, monitoring, and scoring of the exam.

Simulations in approximately 30 subject areas are contained in the data base of the Massachusetts General Hospital. The user can select whatever content material is of particular interest and a time and location that are most convenient. In addition to the feedback to a particular response, most simulations offer medical or program advice through HELP or CONSULTATION, which provide probabilities for certain diagnostic or treatment selections based on historical data bases.

In the simulation used in the Computer Based Examination (CBX) Project, the laboratory tests ordered by the user, the procedures or consultations which are initiated, and the amount and route of drug administration interact with the patient's disease in a realistic time sequence. By simulating the effect on the patient of each action taken by the user and adjusting the patient's status accordingly, the computer model provides a much more life-like, dynamic simulation of the patient-physician encounter than does the CPMP. Through a sampling of the interaction, assessment of a number of patient-oriented factors can be accomplished, such as costs of the workup, risk (pain, complications, mortality), time taken to initiate corrective therapy, and amount of time the patient is kept in the hospital (if hospitalized). In addition, a step-by-step evaluation of the user's actions in test and therapy ordering can be done.

In the computer-assisted simulation of the clinical patient encounter (CASE), the patient-physician encounter is unprompted and undirected. After a brief introduction to the patient, the user receives no further clues. He/she must determine what information is important. The user elicits whatever history, physical examination, and laboratory data are needed for the diagnosis and management of the "patient's" problem.

PART 1A SEGMENT OF A PAPER AND PENCIL
PATIENT MANAGEMENT PROBLEM (PMP)

(Note: In this example, the examinee is presented with a short description of the problem and given a series of choices. Here, he has chosen number 3, followed by number 9. These choices are reflected by "rubbing out" the appropriate number.)

A 42-year-old man with known diabetes is brought to the hospital in a comatose state. There is no obvious evidence of trauma. There is Kussmaul breathing and the breath has an acetone odor. The skin is dry. The eyeballs are soft to palpation. Examination of the heart and lungs shows nothing abnormal except for labored respiration and rapid, regular heart rate of 120 per minute. The abdomen is soft. There is no evidence of enlarged liver or spleen or abnormal masses. Deep tendon reflexes are somewhat hypoactive bilaterally. The rectal temperature is 36.7 C (98.0 F). Blood pressure is 100/70 mm Hg.

You would immediately

- | | |
|---|----------------------------|
| 1. Order serum calcium determination | 1. xxxxxxxxxxxx |
| 2. Order serum bicarbonate determination | 2. xxxxxxxxxxxx |
| 3. Measure venous pressure | 3. 100 mm H ₂ O |
| 4. Order urinalysis (catheterized specimen) | 4. xxxxxxxxxxxx |
| 5. Perform lumbar puncture | 5. xxxxxxxxxxxx |
| 6. Order blood glucose determination | 6. xxxxxxxxxxxx |

You would now

- | | |
|---|-----------------|
| 7. Administer digitalis | 7. xxxxxxxxxxxx |
| 8. Administer morphine | 8. xxxxxxxxxxxx |
| 9. Administer insulin | 9. Ordered |
| 10. Administer coramine | 10. xxxxxxxx |
| 11. Start intravenous infusion with normal saline | 11. xxxxxxxx |

SOURCE: Skakun et al., 1978

PART 2A SEGMENT OF A COMPUTERIZED
PATIENT MANAGEMENT PROBLEM (CPMP) WITH FEEDBACK

(Note: In this example the computer has been asking a series of questions on a particular pediatric problem with each question followed by a list of choices. Here, the user has chosen number 101, "Type of feeding," and the computer has answered, "Breast feed...Taken well." Note that this could have been done manually. By pressing the space bar, the user is automatically branched to the appropriate next series of questions, based upon his "101" response.)

Computer: What points in the history obtained from the mother or from the nursery notes would be particularly pertinent:

- 101 Type of feeding
- 102 Mother and baby blood groups
- 103 Health of siblings
- 104 Maternal use of drugs or medication
- 105 Family history of blood or liver disease
- 106 Any vomiting?
- 107 Increased sweating
- 108 Color and nature of stools
- 109 Color of urine

User: 101

Computer: Breast fed...Taken well

Press Space Bar to Continue

Source: Skakun et al., 1978

PART 3

EXAMPLES OF SIMULATIONS FROM THE
MASSACHUSETTS GENERAL HOSPITAL

(Note: Four different types of simulations are illustrated here: (1) a static patient model, (2) a dynamic patient model, (3) a physiologic model, and (4) a disease process model. User's entries are underlined. The numbered entries correspond to the inquiries that are reproduced by the computer, with the corresponding answers, immediately following the number inquiries. For example, in the first illustration, the typed entry "#1" inquires as to the "Character of Pain." The first illustration also includes an estimate of disease probabilities provided by the HELP program.)

Illustration Number One: Static Patient Model.

A 45-YEAR OLD WHITE MALE USED-CAR SALESMAN IS BROUGHT TO THE EMERGENCY ROOM BY HIS ANXIOUS WIFE BECAUSE HE COMPLAINS OF MODERATE EPIGASTRIC PAIN WHICH STARTED ABOUT A WEEK AGO AFTER A NIGHT OUT WITH THE BOYS PLAYING POKER.

(At this point, the user begins his/her interrogation of the "patient.")

ITEM #1: CHARACTER OF PAIN: IT'S A HOT, BURNING PAIN, LIKE MY STOMACH IS ON FIRE.

ITEM #8: VOMITING: I OFTEN VOMIT, AND THEN THE PAIN IS SOMETIMES BETTER.

ITEM #18: DOES EATING A MEAL AFFECT YOUR PAIN: I FEEL BEST RIGHT AFTER A MEAL, ESPECIALLY WHEN I HAVE ICE CREAM FOR DESSERT.

ITEM #4: WHEN DID YOU FIRST HAVE THIS PAIN: I'VE BEEN HAVING PAINS LIKE THIS FOR A NUMBER OF YEARS. IT SEEMED TO START WHEN I WAS IN KOREA. IT GETS PARTICULARLY BAD WHEN THE NEW MODEL CARS COME OUT IN THE FALL.

(If the user requests the HELP function at this point, he/she receives the following information.)

ITEM #HELP

AT THIS POINT

ESTIMATED DISEASE PROBABILITIES

(3) PEPTIC ULCER (GASTRO/DUODENAL) 0.648

(6) ACUTE GASTRITIS 0.087

(7) ACUTE GASTROENTERITIS (VIRAL OR BACTERIAL) 0.063

WOULD YOU LIKE SUGGESTIONS FOR FURTHER WORKUP? YES

COMPUTER' S SUGGESTED TESTS

- (4) WHEN DID YOU FIRST GET THIS PAIN
- (3) HOW LONG DO THE PAINS LAST
- (33) TENDERNESS TO PALPATION
- (15) ANTACID RELIEF

WHAT IS YOUR IMPRESSION? GIVEN THE DATA YOU HAVE THUS FAR, WHAT DIAGNOSIS DO YOU THINK SHOULD BE MOST SERIOUSLY CONSIDERED?

DIAGNOSIS: ULCER
BE MORE SPECIFIC

DIAGNOSIS: ULCER OF DUDENUM
WHEN YOU TYPED 'DUDENUM', DID YOU MEAN 'DUODENAL'? YES

(At this point, the computer has interrupted to request the user to state his/her leading diagnostic impression. Note that the computer can recognize non-specific diagnoses and simple mis-spellings.)

YOU MAY NOW COLLECT MORE INFORMATION IF YOU CHOOSE TO DO SO

ITEM #7: HEARTBURN: THAT'S WHAT I'VE BEEN TELLING YOU, DOC. I HAVE TERRIBLE HEARTBURN, PARTICULARLY WHEN MY WIFE NAGS ME.

(At any time, the user may terminate the interaction by indicating that he/she wishes to make a final diagnosis; i.e., by entering the letter "D.")

ITEM#D:

DIAGNOSIS: PEPTIC ULCER OF DUODENUM

AN EXCELLENT CHOICE: BUT PERHAPS A DIAGNOSIS IS SLIGHTLY PREMATURE.
WOULD YOU ADMIT THIS PATIENT TO THE HOSPITAL? YES
WOULD YOU SCHEDULE A LAPAROTOMY FOR THIS PATIENT? NO

Illustration Number Two: Dynamic Patient Model.

THE PATIENT IS A 41-YEAR-OLD WOMAN WHO WAS ADMITTED 2 WEEKS AGO WITH SEVERE BIVENTRICULAR FAILURE. SHE HAD BEEN SLOWLY IMPROVING WITH BEDREST AND DIURETICS BUT NOW, ACCORDING TO THE AIDE, "LOOKS TERRIBLE. " WHAT DO YOU DO FIRST?

1. TAKE AN EKG
2. START ON IV
3. CHECK MAJOR VESSELS FOR PULSES, SEE IF PATIENT IS BREATHING
4. GIVE A SHOT OF INTRACARDIAC EPINEPHRINE
5. IMMEDIATE ELECTRICAL CARDIOVERSION
6. GIVE A SHARP BLOW TO THE PRECORDIUM

#3

THERE ARE NO PALPABLE CAROTID OR FEMORAL PULSES; THE PATIENT IS APNEIC AND DOES NOT RESPOND TO YOUR SHOUT. WHAT IS YOUR NEXT MOVE?

1. START CHEST COMPRESSION
2. GIVE A SHARP BLOW TO THE PRECORDIUM WITH YOUR FIST
3. QUICKLY GO OUT AND YELL FOR HELP
4. TAKE AN EKG
5. TILT BACK THE HEAD AND GIVE FOUR BREATHS

#2

THE AMERICAN HEART ASSOCIATION DOES NOT RECOMMEND USE OF THE PRECORDIAL THUMP IN UN-WITNESSED ARRESTS. THE DANGER IS THAT OF PRODUCING VENTRICULAR FIBRILLATION IN THE ANOXIC HEART. THERE ARE REPORTS OF SUCCESSFUL USE OF "THUMP-VERSION" IN SITUATIONS OTHER THAN WITNESSED ARRESTS, BUT THESE ARE STILL LARGELY ANECDOTAL. THE OFFICIAL POLICY IS THAT PRE-CORDIAL THUMP SHOULD ONLY BE USED WITHIN THE FIRST MINUTE OF AN ARREST. YOU TILT BACK THE HEAD AND GIVE FOUR QUICK BREATHS. THE MOST IMPORTANT STEP IS TO ENSURE AN ADEQUATE AIRWAY AND RESPIRATIONS. THIS ALONE IS SOMETIMES SUFFICIENT TO RESUSCITATE A PATIENT. NO RESPONSE TO PROVIDING AN AIRWAY AND GIVING SEVERAL QUICK BREATHS. WHAT DO YOU DO NOW?

1. START CHEST COMPRESSION
2. GIVE A SHARP BLOW TO THE PRECORDIUM
3. YELL FOR HELP WHILE STARTING EXTERNAL CHEST COMPRESSION
4. TAKE AN EKG

#3

GOOD. YOU WISH TO INITIATE CARDIOPULMONARY RESUSCITATION AS QUICKLY AS POSSIBLE, BUT MUST NOT OVERLOOK THE FACT THAT IT IS MORE EFFECTIVELY PERFORMED BY TWO PEOPLE THAN ONE. IN THE HOSPITAL, TRAINED HELP SHOULD BE JUST A SHOUT AWAY. THE PATIENT REMAINS PULSELESS. ONE OF THE FLOOR NURSES HAS JOINED YOU. WHAT SHOULD YOU DO?

1. INTUBATE THE PATIENT
2. TAKE AN EKG
3. START VENTILATION AND CHEST COMPRESSION
4. GIVE THE PATIENT AN INJECTION OF INTRACARDIAC EPINEPHRINE

#3

The interaction continues to completion.)

Illustration Number Three: Physiologic Model.

(Note: In this illustration, the patient has a tube draining to the outside from the gallbladder area, probably following gallbladder surgery. The patient is also on anticoagulant therapy, and the purpose of this exercise is to illustrate the effect on clotting time from this related surgery.)

INITIAL CONDITIONS: PATIENT IS DRAINING MATERIAL FROM A T-TUBE.

CONTROL IS 12.5 SECONDS (This refers to the normal clotting time, and the user is attempting to slow the clotting time with the anti-coagulant drug, warfarin.)

DAY 1: PATIENT'S CLOTTING TIME IS 12.5 SECONDS.
WARFARIN DOSE: 20-MG

DAY 2: PATIENT'S CLOTTING TIME IS 14.5 SECONDS.
WARFARIN DOSE: 7.5 MG
PATIENT NOW ON DISULFIRAM

DAY 3: PATIENT'S CLOTTING TIME IS 22.7 SECONDS.
WARFARIN DOSE: HELP

THE FOLLOWING POINTS MAY BE HELPFUL:

DISULFIRAM POTENTIATES WARFARIN. IT HAS NOT BEEN WELL-STUDIED BUT IS PROBABLY DUE TO INHIBITION OF HEPATIC METABOLISM. A PATIENT WITH A BILIARY FISTULA OR T-TUBE DRAINAGE (ESPECIALLY WITH ASSOCIATED PANCREATIC DISEASE) IS MORE SENSITIVE TO WARFARIN BECAUSE OF A DECREASED VITAMIN K ABSORPTION.

WARFARIN DOSE: 7.5 MG

DAY 4: PATIENT'S CLOTTING TIME IS 31 SECONDS.
WARFARIN DOSE: 5 MG

DAY 5: PATIENT'S CLOTTING TIME IS 44.3 SECONDS.

HEMORRHAGE HAS OCCURRED BECAUSE OF EXCESSIVE ANTICOAGULATION
...WARFARIN DISCONTINUED.. .VITAMIN K GIVEN.

NEW PATIENT

INITIAL CONDITIONS. PATIENT RECEIVING ADRENOCORTICOSTEROIDS.

CONTROL IS 13.1 SECONDS.

DAY 1: PATIENT'S CLOTTING TIME IS 13.1 SECONDS.
WARFARIN DOSE: HELP
DO YOU HAVE A GENERAL IDEA OF DOSES USED? YES

THE FOLLOWING POINTS MAY BE HELPFUL:

PATIENTS ON ADRENOCORTICOSTEROIDS ARE REPORTED TO REQUIRE A LARGER DOSE OF WARFARIN. THE EFFECT IS USUALLY NOT LARGE. THE MECHANISM IS POORLY UNDERSTOOD BUT MAY BE RELATED TO THE WELL-KNOWN BUT LITTLE UNDERSTOOD TENDENCY OF THE ADRENOCORTICAL STEROIDS TO PRODUCE A 'HYPERCOAGULABLE STATE' BY INCREASING CLOTTING FACTOR SYNTHESIS.

WARFARIN DOSE: 35 MG

DAY 2: PATIENT'S CLOTTING TIME IS 15.4 SECONDS.

WARFARIN DOSE: 0 MG

DAY 3: PATIENT'S CLOTTING TIME IS 16.7 SECONDS.

WARFARIN DOSE: 10 MG

(The interaction can be terminated here or subsequently.)

Illustration Number Four: Disease Process Model.

THE PATIENT IS A 44 YEAR OLD FEMALE WHO HAS BEEN REFERRED FROM A COMMUNITY HOSPITAL FOR TREATMENT OF DIABETIC ACIDOSIS. THEY HAD NO BEDS. HER FAMILY IS NOT SURE ABOUT HER INSULIN DOSE.

PHYSICAL EXAM: MENTAL STATUS

WHEN YOU TYPED 'MENTAL STATUS,' DID YOU MEAN 'MENTAL STATE'?

YES OBTUNDED

PHYSICAL EXAM: ORTHOSTATIC VITAL SIGNS. BLOOD PRESSURE: 92/58 PULSE: 103
AFTER SITTING THE PATIENT UP APICAL PULSE RISES BY 23, SYSTOLIC BLOOD PRESSURE FALLS BY 32

PHYSICAL EXAM: SKIN. COLOR NORMAL. TURGOR VERY POOR.

PHYSICAL EXAM: _____ (The blank tells the computer to move on to the next section.)

TEST: BLOOD SUGAR. SENT TO THE LAB.

TEST: URINALYSIS. SPECIFIC GRAVITY: 1.040; SUGAR: 4+; ACETONE: LARGE:

MICRO: 10-20 WHITE BLOOD CELLS, FEW BACTERIA

TEST: ELECTROLYTES. SENT TO LAB.

TEST: URINE CULTURE. SENT TO LAB.

TEST: _____.

THERAPY ORDERS FOR NEXT HOUR.

Rx: ONE LITER NORMAL SALINE.

Rx: CZ INSULIN 50 UNITS INTRAVENOUS.

Rx: CZ INSULIN 50 UNITS SUBCUTANEOUS.

Rx: KCL 20 MEQ IN THE INTRAVENOUS SOLUTION.

Rx: _____.

ENDING THERAPY FOR TIME 0

ONE HOUR WILL NOW PASS.

LAB TEST RESULTS FROM PREVIOUS HOUR:

BLOOD SUGAR: 567 MG %.

NA: 137 MEQ/L: K: 3.1 MEQ/L: C02: 8 MEQ/L.

PHYSICAL EXAM: VITAL SIGNS. BLOOD PRESSURE: 95/57; PULSE: 102; T: 99 PO; R: 31.

PHYSICAL EXAM: ABDOMEN. BOWEL SOUNDS PRESENT. NO ENLARGED ORGANS.

PHYSICAL EXAM: _____.

TEST: EKG. PROMINENT U WAVES.

TEST: ELECTROLYTES. SENT TO LAB.

TEST: BLOOD SUGAR. SENT TO LAB.

TEST: BLOOD GAS ANALYSIS. P02: 92; PC02: 23; PH: 7.08.

TEST: _____.

THERAPY ORDERS FOR NEXT HOUR.

Rx: HELP.

DO YOU WANT 1-MEDICAL ADVICE OR 2-HELP WITH THE MECHANICS OF USING THE COMPUTER? 1

YOU USED AS INITIAL THERAPY 50 UNITS CZ INSULIN AND 50 UNITS SUBCUTANEOUS CZ INSULIN . YOUR INITIAL INSULIN DOSE WAS ADEQUATE BUT THE BLOOD SUGAR IS STILL HIGH. CONTINUE WITH ANOTHER 100 UNITS INTRAVENOUS CZ INSULIN. THE AVERAGE PATIENT IN KETOACIDOSIS REQUIRES 500 UNITS OF INSULIN (TOTAL), WITH A RANGE OF 100-1500 IN LARGE SERIES!

YOU GAVE 1 LITER INTRAVENOUSLY. THIS IS REALLY ADEQUATE INITIAL HYDRATION. YOU WILL FIND THAT PATIENTS IN KETOACIDOSIS REQUIRE LARGE VOLUMES OF FLUID -- AVERAGING 6 - 8 LITERS, AND SOMETIMES OVER 15 LITERS.

BICARBONATE IS PROBABLY NOT NEEDED IN MOST PATIENTS. BECAUSE CO₂ DIFFUSES QUICKLY OUT OF THE CEREBROSPINAL FLUID AND HC0₃ LESS QUICKLY IN, YOU MAY GET A PARADOXICAL CEREBROSPINAL FLUID ACIDOSIS IF YOU CORRECT THE SYSTEMIC ACIDOSIS TOO QUICKLY WITH BICARBONATE.

YOU GAVE 20 MEQ KCL. APPROPRIATE TO START. WITH THE SERUM K FALLING, NOW IS THE TIME TO START ADDING KCL TO EACH BOTTLE. I SUGGEST 60 MEQ OVER THE NEXT HOUR.

Rx: 2 LITERS HALF NORMAL SALINE.
 RX: 60 MEQ KCL.
 Rx: 100 UNITS CZ INSULIN INTRAVENOUSLY.
 Rx: _____.

ENDING THERAPY FOR TIME 1 HOUR

ONE HOUR WILL NOW PASS.

(Several simulated hours later.)

YOU SEEM TO HAVE THINGS WELL IN HAND. THE PH IS 7.33, THE K IS 3.57, THE BLOOD SUGAR IS 90 AND THE SERUM ACETONE IS NEGATIVE. THE PATIENT IS ALERT AND HAS NORMAL VITAL SIGNS.

LET US STOP NOW. YOU MAY BEGIN AGAIN WITH ANOTHER PATIENT IF YOU WISH.

PART 4

A SIMULATED PATIENT - PHYSICIAN ENCOUNTER
IN THE
COMPUTER-BASED EXAMINATION (CBX) PROJECT

(Note: In this interaction, the underlined items indicate the user inputs; all other materials are generated by the computer.)

A 58 YEAR OLD WHITE FEMALE COMES TO YOUR OFFICE REQUESTING A PHYSICAL EXAMINATION

REQUEST? HISTORY

RESULTS DUE TUESDAY AT 8:12 A.M.
**** ORDERED ****

HISTORY REQUIRES 0.2 HOURS

REQUEST? RESULT

RESULTS OF HISTORY

A 58 YEAR OLD WELL DRESSED WHITE WOMAN ENTERS YOUR OFFICE. SHE IS IN NO APPARENT ACUTE DISTRESS AND INDICATES THAT SHE IS SEEKING MEDICAL ASSISTANCE BECAUSE HER "HUSBAND IS WORRIED THAT SHE MAY HAVE HAD A HEART ATTACK THIS MORNING."

SHE INDICATES THAT SHE DOES NOT INDULGE IN MUCH PHYSICAL EXERCISE BUT DID NOTE THAT TWO DAYS AGO WHEN SHE WENT JOGGING WITH FRIENDS FOR THE FIRST TIME IN QUITE A FEW YEARS, SHE DEVELOPED A DULL PAIN IN HER CHEST WHICH WENT AWAY AFTER 3 MINUTES OF REST.

THIS MORNING SHE ATTEMPTED TO PLAY TENNIS WITH FRIENDS FOR THE FIRST TIME IN MANY YEARS AND NOTED A SHARP CHEST PAIN LOCATED IN THE MIDSTERNAL LINE HALF WAY BETWEEN THE UMBILICUS AND THE TOP OF THE STERNUM. THIS PAIN PERSISTED FOR TEN MINUTES AND WAS GREATLY AGGRAVATED BY ANY MOTION OF THE ARMS. SHE DENIES RADIATION DOWN EITHER ARM OR EITHER LEG. SHE NOTED A SLIGHT SHORTNESS OF BREATH WHICH DISAPPEARED AS THE PAIN SUBSIDED. SHE DID NOT RESUME HER TENNIS GAME AND A DULL PAIN STILL PERSISTS OVER THE ANTERIOR CHEST.

THE PATIENT HAD BEEN IN GOOD HEALTH ALL HER LIFE. SHE RECENTLY RETIRED AFTER 29 YEARS IN THE POST OFFICE AND WAS GIVEN A CLEAN BILL OF HEALTH.

1 WEEK PTA THE PATIENT HAD A PHYSICAL EXAMINATION FOR LIFE INSURANCE COVERAGE. AT THAT TIME SHE WAS TOLD THAT HER BLOOD PRESSURE WAS 135/90. SHE WAS SOMEWHAT CONCERNED ABOUT THIS SINCE ON HER YEARLY PHYSICAL ONE YEAR AGO HER BLOOD PRESSURE WAS 110/60 AND ON RETIREMENT TWO MONTHS BEFORE SHE WAS TOLD THAT HER BLOOD PRESSURE WAS 125/80.

SHE DENIES HEADACHES, CHEST PAIN, SHORTNESS OF BREATH, DECREASED TOLERANCE TO ACTIVITY OR A FAMILY HISTORY OF HEART DISEASE. NO OTHER SIGNIFICANT MEDICAL HISTORY. NO RHD, KNOWN MURMURS, CONGENITAL ANOMALIES, HYPERTENSION, OR EARLY DEATHS IN FAMILY. SHE DOES NOT TAKE MEDICATION, USE DRUGS, SMOKE CIGARETTES, OR HAVE ANY EMOTIONAL PROBLEMS.

THE PATIENT IS NEW TO YOUR PRACTICE SINCE SHE RECENTLY MOVED TO THIS TOWN. SHE CURRENTLY WORKS AS A STOCK BROKER (WHICH SHE ENJOYS BUT FINDS STRESSFUL). SHE IS MARRIED AND HAS THREE TEENAGE CHILDREN IN GOOD HEALTH. SHE HAS BLUE CROSS INSURANCE COVERAGE. REQUEST? PHYSICAL EXAMINATION

8:12 A.M. TUESDAY DAY 1

PHYSICAL EXAMINATION REQUIRES 0.6 HOURS
 RESULTS DUE TUESDAY AT 8 :48 A.M. ****ORDERED****

REQUEST? RESULT

RESULTS OF PHYSICAL EXAMINATION

GENERAL: A SLIGHTLY OBESE 58 YEAR OLD WHITE WOMAN IN NO ACUTE DISTRESS.
 SEE SLIDE 1-72.

PULSE 80 /MIN

PULSE QUALITY GOOD

RESPIRATION 20 /MIN

BP SYSTOLIC 135

BLOOD PRESSURE DIASTOLIC 88

HEIGHT 70 INCHES

WEIGHT 70 KILOGRAMS

TEMPERATURE 99.4 F

HEENT: NORMAL EXAM

CHEST: CLEAR A&P. DIAPHRAGMS MOVE EQUALLY AND SYMMETRICALLY.

CARDIAC: PMI IS 1 CM. LATERAL OF THE LMCL. HEART SOUNDS ARE OF GOOD
 QUALITY. THERE IS A SOFT GRADE II/VI APICAL SYSTOLIC
 MURMUR AND A DEFINITE S3. NO RUB.

ABDOMEN: SLIGHTLY OBESE, LIVER IS NOT FELT BELOW THE COSTAL MARGIN. NO
 MASSES, NO LESIONS, NO FLUID WAVE. SPLEEN IS NOT PALPABLE.

GU: NORMAL EXAM

RECTAL: GOOD SPHINCTER TONE, NO MASSES OR ABNORMALITIES. STOOL BROWN.

EXTREMITIES: SYMMETRICAL, WITHOUT DEFORMITIES, CYANOSIS, CLUBBING OR
 EDEMA.

SKIN: SLIGHTLY MOIST. NORMAL TEXTURE AND TEMPERATURE. NO LESIONS.

NEURAL: NERVOUS WOMAN. ALL CRANIAL NERVES ARE INTACT. POSTURE, MOTOR
 AND SENSORY EXAMINATION IS WNL.

REQUEST? CHEST X-RAY

CHEST X-RAY REQUIRES 0.5 HOURS

RESULTS DUE TUESDAY AT 9:30 A.M.

****ORDERED****

LAB NOT YET OPEN:

(THIS TEST IS AVAILABLE STAT)

REQUEST? EMERGENCY ELECTROCARDIOGRAM

EMERGENCY ELECTROCARDIOGRAM REQUIRES 0.2 HOURS

RESULTS DUE TUESDAY AT 9:00 A.M.

ORDERED

REQUEST? RESULT

9:00 A.M. TUESDAY DAY 1

RESULTS OF EMERGENCY ELECTROCARDIOGRAM

RATE: 100/MIN. NORMAL SINUS RHYTHM. AXIS : O
MODERATE ST SEGMENT ELEVATION IN LEADS II, III, AND AVF;
MODERATE ST SEGMENT DEPRESSION IN I, AVL AND V2-V4 .
SEE SLIDE 363.

REQUEST? ICU
PATIENT ADMITTED TO INTENSIVE CARE UNIT

AN XV WILL BE STARTED, PATIENT WILL BE AT BEDREST, PATIENT WILL BE ON A
CARDIAC MONITOR, AND VITAL SIGNS WILL BE TAKEN HOURLY. YOU WILL BE
NOTIFIED OF ANY CHANGES.

DO YOU WISH THE PATIENT TO RECEIVE PARENTERAL FLUIDS? YES

THE PATIENT HAS NOW BEEN PLACED ON PARENTERAL FLUIDS
THE APPROPRIATE DOSE WILL BE GIVEN.

DO YOU WISH THE PATIENT TO RECEIVE BEDREST? YES

THE PATIENT HAS NOW BEEN PLACED ON BEDREST
THE APPROPRIATE DOSE WILL BE GIVEN.

REQUEST? CREATINE PHOSPHOKINASE, SGOT, CBC, SMA-12, ELECTROLYTES

CREATINE PHOSPHOKINASE REQUIRES 4.0 HOURS
RESULTS DUE TUESDAY AT 1:00 P.M. *****ORDERED*****

SGOT REQUIRES 8.0 HOURS RESULTS DUE TUESDAY AT 5:00 P.M.
***** (ORDERED)*****

COMPLETE BLOOD COUNT REQUIRES 2.0 HOURS
RESULTS DUE TUESDAY AT 11:00 A.M. *****ORDERED*****

SMA12 REQUIRES 2.5 HOURS RESULTS DUE TUESDAY AT 11:30 A.M.
*****ORDERED*****

ELECTROLYTES REQUIRES 6.0 HOURS RESULTS DUE TUESDAY AT 3:00 P.M.
*****ORDERED*****

REQUEST? RESULT

RESULTS OF CHEST X-RAY

SEE SLIDES 141 & 142.

REQUEST? RESULT

10:00 A.M. TUESDAY DAY 1 (PATIENT ADMITTED)

NURSE'S NOTES:

INTENSIVE CARE UNIT NOTE

VITAL SIGNS P 72 BP 156/101 T 99.4 R 20

UNCHANGED:

PULSE QUALITY GOOD

APICAL PULSE: NOT TAKEN

RESULTS OF RHYTHM STRIP

NO ARRHYTHMIA

REQUEST? RESULT

RESULTS OF COMPLETE BLOOD COUNT

HEMATOCRIT 45.0 %
 HEMOGLOBIN 14.0 G%
 RBC 5200000 PER CU.MM
 WBC 8200.0
 MCV 88 CU U3
 MCHC 35 %
PMN 63.0 %
 LYMPH 30 %
 MONO 5 %
 EOS 2 %
 BLAST 0 %
 ATYP LYMPH 0 %
 BANDS .0 %
 MYELOCYTES .0 %
 JUVENILE NEUTROPHILS .0 %
 BASOPHILES .0 %
 PLAT FROM CBC 300000

REQUEST? RESULT

RESULTS OF SMA12

CALCIUM 9.5 MG%
 SERUM PHOSPHORUS 3.8 MG/100 ML
 GLUCOSE 80 MG%
 BLOOD UREA NITROGEN 14 MG%
 URIC ACID 4.0 MG%
 SERUM CHOLESTEROL 200MG%
 TOTAL PROTEIN 7.0 GMS %
 ALBUMIN 4.5 GMS %
 TOTAL BILIRUBIN .70 MG%
 ALKALINE PHOSPHATASE 4.0 BODANSKY UNITS
 LACTIC DEHYDROGENASE 130.0 u/ML
 SGOT 10 u/ML

REQUEST? RESULT

NOON TUESDAY DAY 1 (PATIENT ADMITTED)

NURSE'S NOTES :

PATIENT IN NO ACUTE DISTRESS.

INTENSIVE CARE UNIT NOTE

VITAL SIGNS P 72 BP 156/101 T 99.4 R20

UNCHANGED:

PULSE QUALITY GOOD

UNCHANGED:

APICAL PULSE: NOT TAKEN

RESULTS OF RHYTHM STRIP

UNCHANGED:

NO ARRHYTHMIA

REQUEST? RESULT

RESULTS OF CREATINE PHOSPHOKINASE

CREATINE PHOSPHOKINASE 260.0 UNITS

REQUEST? RESULT

RESULTS OF ELECTROLYTES

SODIUM 140

POTASSIUM 4.0 MEQ/L

CHLORIDE 103 MEQ. /L

TOTAL CARBON DIOXIDE 27.0 MEQ. /L

REQUEST? RESULT

RESULTS OF SGOT

SCOT IOU/ML

REQUEST? ADVANCE

HOW MANY HOURS DO YOU WANT TO ADVANCE THE CLOCK? &5

NURSE'S NOTES:

INTENSIVE CARE UNIT NOTE

8:00 P.M. TUESDAY DAY 1 (PATIENT ADMITTED)

VITAL SIGNS P 72 BP 139/92 T 99.4 R 18
 UNCHANGED:
 PULSE QUALITY GOOD
 UNCHANGED:
 APICAL PULSE: NOT TAKEN

RESULTS OF RHYTHM STRIP

UNCHANGED:
 NO ARRHYTHMIA

REQUEST? ADVANCE
 HOW MANY HOURS DO YOU WANT TO ADVANCE THE CLOCK? 12

MORNING ROUNDS:

NOW ON PARENTERAL FLUIDS IV [3173]

NOW ON BEDREST [7181]

VITAL SIGNS P 72 BP 139/92 T 99.4 R 18

UNCHANGED:
 PULSE QUALITY GOOD
 UNCHANGED:
 APICAL PULSE: NOT TAKEN
 THE PATIENT IS IN THE INTENSIVE CARE UNIT.

REQUEST? EMERGENCY ELECTROCARDIOGRAM

EMERGENCY ELECTROCARDIOGRAM REQUIRES 0.2 HOURS
 RESULTS DUE WEDNESDAY AT 8:12 A.M. ***ORDERED****

REQUEST? ADVANCE
 HOW MANY HOURS DO YOU WANT TO ADVANCE THE CLOCK? 24

RESULTS OF EMERGENCY ELECTROCARDIOGRAM

RATE: 100/MIN. NORMAL SINUS RHYTHM, AXIS: O
 Q WAVES PRESENT IN II, III, AND AVF WITH T-WAVE INVERSION AND SLIGHT ST
 SEGMENT ELEVATION IN THESE LEADS. SEE SLIDE 358.

NURSE'S NOTES:

PATIENT RESTING COMFORTABLY.

INTENSIVE CARE UNIT NOTE

NOON WEDNESDAY DAY 2 (PATIENT ADMITTED)

VITAL SIGNS P 72 BP 138/92 T 99.4 R 18
UNCHANGED :
PULSE QUALITY GOOD
UNCHANGED :
APICAL PULSE: NOT TAKEN

RESULTS OF RHYTHM STRIP

UNCHANGED :
NO ARRHYTHMIA

REQUEST? ADVANCE
HOW MANY HOURS DO YOU WANT TO ADVANCE THE CLOCK? 20

NURSE'S NOTES:

INTENSIVE CARE UNIT NOTE

VITAL SIGNS P 72 BP 138/92 T 99.4 R 18
UNCHANGED :
PULSE QUALITY GOOD
UNCHANGED :
APICAL PULSE: NOT TAKEN

RESULTS OF RHYTHM STRIP

UNCHANGED :
No ARRHYTHMIA

REQUEST? ADVANCE
HOW MANY HOURS DO YOU WANT TO ADVANCE THE CLOCK? 16

MORNING ROUNDS :
NOW ON PARENTERAL FLUIDS IV [3173]
NOW ON BEDREST [7181]

VITAL SIGNS P 72 BP 138/92 T 99.4 R 18
UNCHANGED :
PULSE QUALITY GOOD
UNCHANGED :
APICAL PULSE: NOT TAKEN
THE PATIENT IS IN THE INTENSIVE CARE UNIT.

REQUEST? WARD
PATIENT DISCHARGED FROM ICU TO WARD

8:00 A.M. THURSDAY DAY 3 (PATIENT ADMITTED)

REQUEST? EMERGENCY CREATINE PHOSPHOKINASE, EMERGENCY ELECTROCARDIOGRAM
 EMERGENCY CREATINE PHOSPHOKINASE REQUIRES 2.0 HOURS
 RESULTS DUE THURSDAY AT 10:00 A.M. ***ORDERED****

EMERGENCY ELECTROCARDIOGRAM REQUIRES 0.2 HOURS
 RESULTS DUE THURSDAY AT 8:12 A.M. ***ORDERED****

REQUEST? RESULT

RESULTS OF EMERGENCY ELECTROCARDIOGRAM

UNCHANGED:
 RATE: 100/MIN. NORMAL SINUS RHYTHM. AXIS: O
 Q WAVES PRESENT IN II, III, AND AVF WITH T-WAVE INVERSION AND SLIGHT ST
 SEGMENT ELEVATION IN THESE LEADS. SEE SLIDE 358.

REQUEST? RESULT

RESULTS OF EMERGENCY CREATINE PHOSPHOKINASE

CREATINE PHOSPHOKINASE 208.0 UNITS

REQUEST? ADVANCE
 HOW MANY HOURS DO YOU WANT TO ADVANCE THE CLOCK? 24

NURSE'S NOTES:

PATIENT IN NO DISTRESS AND INDICATES SHE WISHES TO BE DISCHARGED.

REQUEST? ADVANCE
 HOW MANY HOURS DO YOU WANT TO ADVANCE THE CLOCK? 24

MORNING ROUNDS:
 NOW ON PARENTERAL FLUIDS IV [3173]
 NOW ON BEDREST [7181]

VITAL SIGNS p 61 BP 183/92 T 99.2 R 18
 UNCHANGED:
 PULSE QUALITY GOOD
 UNCHANGED:
 APICAL PULSE: NOT TAKEN
 THE PATIENT IS IN THE WARD.

REQUEST? ADVANCE
 HOW MANY HOURS DO YOU WANT TO ADVANCE THE CLOCK? 9

5:00 P.M. FRIDAY DAY 4 (PATIENT ADMITTED)

NURSE'S NOTES:

PATIENT THREATENS TO SIGN HERSELF OUT OF HOSPITAL.

REQUEST? ORDER THERAPY

NOW ON PARENTERAL FLUIDS IV [3173]

NOW ON BEDREST [7181]

DO YOU WANT TO TAKE THE PATIENT OFF ONE OF THESE? NO

ENTER THERAPY NUMBER (OR PUSH 'ENTER') 186

DO YOU WISH THE PATIENT TO RECEIVE REASSURANCE? YES

THE PATIENT HAS NOW BEEN PLACED ON REASSURANCE

THE APPROPRIATE DOSE WILL BE GIVEN.

ENTER THERAPY NUMBER (PUSH 'ENTER')

REQUEST : ADVANCE

HOW MANY HOURS IN YOU WANT TO ADVANCE THE CLOCK? 24

NURSE'S NOTES :

PATIENT CONTINUES TO HAVE UNEVENTFUL RECOVERY.

DO YOU WISH TO KNOW THE CORRECT DIAGNOSIS? YES
 CORRECT DIAGNOSIS

NOT YET AVAILABLE

NUMBER OF DAYS IN HOSPITAL	5	
COST OF DIAGNOSTIC WORKUP		\$ 181.00
COST OF THE HOSPITAL ROOM (\$90/DAY)		\$ 450.00
COST OF INTENSIVE CARE UNIT (\$8/HOUR)		\$ 376.00
TOTAL COST OF MEDICAL CARE		\$ 1007.00

DO YOU WANT TO MANAGE ANOTHER PATIENT? NO
 GOOD BYE

PART 5AN EXAMPLE OF A COMPUTER ASSISTED SIMULATION OF THE
CLINICAL PATIENT ENCOUNTER (CASE)

(Note: The question marks identify the user's inquiries. The user's input is indicated by asterisks. Everything else is generated by the computer.)

YOU ARE THE EVENING ATTENDING PEDIATRICIAN IN A BUSY METROPOLITAN EMERGENCY ROOM. THE EMERGENCY SQUAD WHEELS IN A 15 YEAR OLD, WELL-BUILT MALE ADOLESCENT ON A STRETCHER. HE APPEARS TO BE IN MODERATE DISTRESS, LOOKING ABOUT ANXIOUSLY. HIS SPEECH IS SOMEWHAT GARBLED, AND HE IS DROOLING FROM THE CORNER OF HIS MOUTH.

? * WHY DID THEY BRING YOU HERE

I HAVEN'T BEEN ABLE TO MOVE FOR THE PAST THREE HOURS. I'M REALLY **SCARED**. MY AUNT CALLED THE EMERGENCY SQUAD BECAUSE SHE GOT WORRIED, SO THAT'S WHY I'M HERE.

? * HAS THIS HAPPENED BEFORE

IT HAPPENED THE FIRST TIME WHEN I WAS 14. IT'S WIERD TO WAKE UP ONE MORNING AND NOT BE ABLE TO MOVE A MUSCLE.

? * OTHER ILLNESSES

(Note: The user has begun to use abbreviated inquiries.)

I'VE ALWAYS BEEN PRETTY HEALTHY. I HAD THE MEASLES AND ALL THAT AS A KID, AND SOMETIMES I GET A COLD, BUT IT'S NEVER VERY SERIOUS.

? * GO OUT FOR SPORTS

I LIKE JUST ABOUT ANYTHING YOU DO OUTDOORS. I SPEND LOTS OF TIME ON MY BIKE. I REALLY LIKE SWIMMING TOO. WE SOMETIMES GO FOR HIKES WHEN THE WEATHER IS NICE - BERNADINE AND ME. WE'LL TAKE A PICNIC LUNCH SOMEWHERE.

? *WHO IS BERNADINE

I THINK MY BEST FRIEND ALL THE WAY AROUND IS BERNADINE. WE SPEND A LOT OF TIME TOGETHER AND CAN TALK ABOUT ANYTHING.

? * SISTERS

PAUL IS 18 AND FINISHING HIGH SCHOOL. ELLEN IS 9.

? * GO TO SCHOOL

I'M IN THE NINTH GRADE NOW.

?* ANY OTHER MEMBERS OF YOUR FAMILY HAVE THE SAME PROBLEM

I DON'T KNOW OF ANYONE WHO'S BEEN PARALYZED LIKE I AM.

? * TRAVEL

I'VE BEEN TO CANADA BEFORE. ..LAST SUMMER ON A BIKING TRIP. I HAVEN'T BEEN ANYWHERE ELSE, THOUGH.

? * HAVE SEIZURES

I'VE NEVER BEEN IN ANY ACCIDENTS OR ANYTHING. I MAY SKIN MYSELF UP SOMETIMES , BUT THAT ' S ABOUT IT.

? * HOW IS YOUR VISION

I HAVEN' T HAD ANY TROUBLE WITH MY VISION. I 'VE NEVER EVEN WORN GLASSES OR ANYTHING LIKE THAT.

? * MOODY

I'M PRETTY HAPPY MOST OF THE TIME.

? * SPEECH PROBLEM

IT' S JUST WHEN I'M PARALYZED. I **CAN** 'T GET MY WORDS OUT CLEARLY.

? * FAMILY HISTORY OF ILLNESSES

THERE AREN'T ANY DISEASES THAT RUN IN THE FAMILY, THAT I'M AWARE OF. I DO KNOW THERE ARE AN AWFUL LOT OF RELATIVES WHO HAVE JUST DIED IN THEIR SLEEP . THAT'S SCARY.

? * WHAT DO YOU MEAN DIED IN THEIR SLEEP

I AM AFRAID OF DYING. I MEAN, NOBODY KNOWS WHY MY RELATIVES HAVE DIED IN THEIR SLEEP . . . HOW DO I KNOW THE SAME THING WON'T HAPPEN TO ME? I HOPE WE CAN FIGURE THIS ALL OUT.

? * HAVE ANY PROBLEMS WITH COORDINATION

I HAVEN'T HAD ANY COORDINATION PROBLEMS, EXCEPT FOR WHEN I'M PARALYZED, OF COURSE.

? * DIZZY

I'VE NEVER HAD A DIZZY SPELL.

? * FAINTING

I PASSED OUT ONCE FROM DRINKING TOO MUCH BEER WITH FRIENDS ONCE, BUT THAT'S ALL .

? * SMOKE

I'VE SMOKED CIGARS AND CIGARETTES BEFORE. SOMETIMES I LIGHT UP IF I'M WITH A LOT OF GUYS WHO SMOKE. AND THE CIGARS -WELL - THE'Y ARE AWFUL.

? * DRUGS

I DON'T TAKE ANY MEDICINE.

? * DRINK

ALL OF OUR FRIENDS LIKE DRINKING BEER. WE FIND SOMEONE OLD ENOUGH TO BUY US BEER AND THEN TAKE IT OUT TO PARTY. BEER'S ALL WE EVER HAVE.

? * EATING HABITS

I LIKE JUST ABOUT EVERYTHING, SO I EAT WHATEVER IS PUT IN FRONT OF ME. I EAT OKAY WHEN I'M AT HOME. I LIKE FRUIT, GREEN VEGETABLES, MEATS. . . ALL THAT STUFF. IT'S JUST THAT WHEN I'M OUT WITH MY FRIENDS THAT I LIKE PIZZAS AND BIG MACS. I WOULDN'T SAY I'M MALNOURISHED OR ANYTHING.

? * STOMACH PROBLEMS

I'VE NEVER HAD ANY STOMACH TROUBLE.

? * HEADACHES

I VERY SELDOM HAVE HEADACHES. ASPIRIN ALWAYS GETS RID OF THEM ANYHOW.

? * PAIN

I'M NOT IN PAIN . . . I JUST CAN'T MOVE.

? * p

(Note: The user asks to enter the physical examination section "p" of the CASE.)

** PE **

GENERAL APPEARANCE--

WELL DEVELOPED, WELL NOURISHED, WELL HYDRATED WHITE MALE ADOLESCENT WHO APPEARS TO BE IN MODERATE DISTRESS, LOOKING ANXIOUSLY ABOUT. HE OCCASIONALLY DROOLS FROM THE CORNER OF HIS MOUTH.

? * h

(Note: The user asks to reenter the history section "h" of the CASE.)

** HISTORY **

? * HOW LONG HAVE YOU BEEN DROOLING

I JUST CAN'T CONTROL IT. I HATE IT WHEN I DROOL LIKE THIS. AS SOON AS I CAN'T MOVE, THIS HAPPENS. IT'S BEEN A COUPLE HOURS NOW SINCE THIS HAPPENED.

? * DO YOU ALWAYS DROOL WHEN YOU HAVE THESE PROBLEMS

THIS HAPPENED TWICE BEFORE TO ME.

? * P

(Note: The user asks to reenter the physical examination section "p" of the CASE.

** PE **

? * VITAL SIGNS

TEMPERATURE - 37 c. (ORAL)
PULSE - 150 AND REGULAR
RESPIRATION - 30/MINUTE
BLOOD PRESSURE - 110/70 SUPINE; 100/56 SITTING WITH ASSISTANCE

? * CHEST INSPECTION

CHEST - APPEARANCE--
SYMMETRICAL, WITH FULL EXPANSION. NORMAL A-P DIAMETER. NO DEFORMITIES OR VISIBLE PULSATIIONS.

? * CHEST PERCUSSION

CHEST - PERCUSSION --
NORMAL RESONANCE. DIAPHRAGM MOVES NORMALLY WITH RESPIRATION.

? * CHEST AUSCULTATION

CHEST -AUSCULTATION--
NORMAL BREATH SOUNDS IN ALL LUNG FIELD. VOCAL FREMITUS NORMAL.

? * HEART INSPECTION

HEART - INSPECTION--
PMI VISIBLE IN 5TH INTERCOSTAL SPACE NEAR MID-CLAVICULAR LINE. THE PRECORDIUM IS SOMEWHAT HYPERACTIVE.

? * HEART PALPATION

HEART - PALPATION--
VERY ACTIVE PRECORDIUM. NO THRILLS OR HEAVES. PROMINENT SYSTOLIC IMPULSE.

? * HEART AUSCULTATION

HEART - AUSCULTATION--
150/MINUTE. GRADE 2/6 SYSTOLIC EJECTION MURMUR AT LOWER LEFT STERNAL BORDER.

? * HEART PERCUSSION

HEART - PERCUSSION--
NORMAL HEART SIZE TO PERCUSSION.

? * EXTREMITIES

EXTREMITIES--

NORMAL COLOR WITHOUT CYANOSIS, CLUBBING OR EDEMA. NO VARICOSITIES. NO TREMOR. PERIPHERAL PULSES EQUAL AND BOUNDING BILATERALLY. JOINTS NORMAL. SHOULDERS NORMAL.

? * REFLEXES

DEEP TENDON REFLEXES--

ABSENT

? * MUSCLE STRENGTH

MUSCLE STRENGTH--

FLACCID. WHEN ARM IS HELD OVER FACE AND DROPPED, IT FALLS ON PATIENT'S FACE.

? * CRANIAL NERVES

CRANIAL NERVES --

I INTACT SMELL. II, III, IV, VI INTACT. PUPILS ARE EQUAL, ROUND AND REACTIVE TO LIGHT AND ACCOMMODATION. FUNDOSCOPIC NORMAL. VII FACE APPEARS DROOPY. FACIAL MOVEMENT WITH DIFFICULTY. V SLIGHT WEAKNESS OF MASSETERS. SENSATION INTACT. VIII INTACT. IX, X DECREASED BUT PRESENT GAG REFLEX. SENSATION INTACT. UVULA ELEVATES SLIGHTLY. REGURGITATES ON SWALLOWING. SOME HOARSE TONE TO VOICE. XI DECREASED STRENGTH OF TRAPEZIUS AND STERNOCLEIDOMASTOID. XII DECREASED STRENGTH OF TONGUE MOVEMENTS.

? * GAIT

GAIT--

NOT ABLE TO WALK.

? * MOTOR SYSTEM

MOTOR SYSTEM

DECREASED MUSCLE TONE, STRENGTH. MUSCLE MASS NORMAL.

? * BABINSKI

BABINSKI REFLEX--

ABSENT BILATERALLY (NO MOVEMENT OF TOES UP OR DOWN).

? * EYES

EYE EXAMINATION--

CONJUNCTIVA AND SCLERA CLEAR - NO INJECTION, PETECHIAE, JAUNDICE, PTOSIS, LID LAG, EDEMA. PUPILS EQUAL AND ROUND AND NORMAL REACTION TO LIGHT AND ACCOMMODATION.

? * JOINTS

EXTREMITIES--

NORMAL COLOR WITHOUT CYANOSIS, CLUBBING OR EDEMA. NO VARICOSITIES. NO TREMOR. PERIPHERAL PULSES EQUAL AND BOUNDING BILATERALLY. JOINTS NORMAL. SHOULDERS NORMAL.

? * L

(Note: The user asks to enter the laboratory section "L" of the CASE.)

**** LAB ****

? * CBC

COMPLETE BLOOD COUNT--

		NORMALS
R N	5,200,000	4,6-6.2 x 1,000,000
WBC	15,000	4.8-10.8 x 1,000
HGB	15 GM/100 ML	14-18
HCT	45%	42-52
DIFFERENTIAL -		
POLY	70%	40-70
STAB	10%	0-6
LYMPH	12%	20-45
MONO	4%	2-8
EOS	3%	0-5
BASO	1%	0-1
NRBC/100 WBC	NONE	
ANISOCYTOSIS	NONE	
POIKILOCYTOSIS	NONE	
CHROMICITY	NORMAL	
PLATELETS	ADEQUATE	

? * URINALYSIS

URINALYSIS--

APPEARANCE: AMBER YELLOW, CLEAR
 REACTION (PH): 6.5 (NORMAL REACTION (PH): 4.6-8.0)
 DIACETIC ACID: NEGATIVE
 BILE PIGMENT: NEGATIVE
 UROBILINOGEN: NEGATIVE
 REDUCING SUGAR: NEGATIVE

PROTEIN : NEGATIVE
 SPECIFIC GRAVITY : 10,010 (NORMAL: 1.001-1.035)
 ACETONE : NEGATIVE

MICROSCOPIC URINALYSIS--

BACTERIA: NEGATIVE
 CRYSTALS: NEGATIVE
 EPITHELIAL CELLS: 0-3/HPF
 LEUKOCYTES: 0-3 WBC/HPF
 ERYTHROCYTES: 0-3 RBC/HPF
 CASTS: NEGATIVE

? * SMAL

THE SPECIFIED TEST IS NOT AVAILABLE IN THE LABORATORY SECTION.

? * SMAL,2:

SMA 12--		NORMALS
CALCIUM	10 MG/100 ML	9-10.8
INORG. PHOSPH.	4 MG/100 ML	3.0-4.5
FASTING GLUCOSE	82 MG/100 ML	60-100
BUN	7 MG/100 ML	8-25
URIC ACID	6 MG/100 ML	3.5-7.0
CHOLESTEROL	210 MG/100 ML	150-27(3)
TOTAL BILIRUBIN	0.7 MG/100 ML	0.3-1.1
ALBUMIN	4 GM/100 ML	3.5-5.5
TOTAL PROTEIN	7 GM/100 ML	6-8
ALK. PHOSPH.	9 KA UNITS	5-13
LDH (WACKER)	95 UNITS/ML	80-120
SGOT (KARMEN)	28 UNITS/ML	15-40

? * SERUM ELECTROLYTES

SERUM ELECTROLYTES--

		NORMAL
CL	99 MEQ/L	100-106
NA	140 MEQ/L	135-145
K	1.8 MEQ/L	3.5-5.0
TOTAL CO ₂	27 MEQ/L	24-30

? * EKG

ELECTROCARDIOGRAM:

RATE " 150
 RHYTHM - SINUS TACHYCARDIA
 QRS AXIS - +60
 T A X I S - + 4 0
 PR INTERVAL - 0.17
 QRS DURATION - 0.10

QT INTERVAL - 0.34

T WAVES ARE INVERTED AND ST SEGMENTS ARE DEPRESSED. U WAVES ARE PROMINENT.

? * CHEST XRAY

CHEST --

PA AND LATERAL CHEST FILMS SHOW WELL EXPANDED LUNG FIELDS WITHOUT EVIDENCE OF CONGESTION OR ACTIVE INFECTION. DIAPHRAGMS ARE SMOOTH, COSTOPHRENIC

ANGLES ARE CLEAR AND THE CARDIOVASCULAR SHADOW IS NORMAL FOR THE AGE. BONES APPEAR INTACT AND OF GOOD DENSITY.

?*SED RATE

ERYTHROCYTE SED RATE (WESTERGREIN) --

10 MM/HR (NORMAL: 0-15)

? * D

(Note: The user asks to enter the diagnosis "d" section.

AFTER YOU BEGIN THE DIAGNOSIS AND MANAGEMENT SECTIONS YOU WILL BE UNABLE TO GO BACK TO THE HISTORY, PHYSICAL OR LABORATORY SECTIONS OF THIS CASE. IF THERE IS ANYTHING MORE YOU WISH TO ASK THE PATIENT OR OTHER TESTS YOU'D LIKE TO ORDER, TYPE H, P OR L TO RETURN TO THESE SECTIONS. IF YOU ARE READY TO LIST YOUR DIAGNOSES AND TREATMENT FOR THE PATIENT, TYPE D .

* D

** DIAGNOSIS AND TREATMENT **

PLEASE TYPE THE DIAGNOSES FOR THE PROBLEM THAT YOU PERCEIVE ED HARRISON TO HAVE.

ENTER ONLY ONE DIAGNOSIS PER LINE. SECONDARY DIAGNOSES SHOULD BE LISTED SEPARATELY FROM PRIMARY DIAGNOSES -- E.G., DO NOT LIST 'ACUTE PYELONEPHRITIS WITH SEPSIS' ON ONE LINE. PLEASE LIST THE DIAGNOSES SEPARATELY SO THAT YOU WILL RECEIVE CREDIT FOR BOTH. HIT THE RETURN KEY AFTER EACH DIAGNOSIS AND WAIT FOR THE 'DX:' TO APPEAR BEFORE ENTERING ANOTHER. TYPE A '\$' AFTER YOUR LAST DIAGNOSIS.

** NOTE - THE DOLLAR SIGN (\$) INDICATES THAT YOU HAVE COMPLETED A SECTION AND TAKES YOU ON TO THE NEXT SECTION. PLEASE BE SURE YOU HAVE ENTERED ALL THE INFORMATION BEFORE TYPING '\$' AS YOU WILL NOT BE ABLE TO MAKE ADDITIONS TO THE SECTION YOU HAVE JUST COMPLETED. **

DX: * HYPOKALEMIA

DX: * FAMILIAL INTERMITTENT (PERIODIC) PARALYSIS
PLEASE BE MORE DESCRIPTIVE ABOUT THE TYPE OF PARALYSIS YOU FEEL ED HARRISON HAS.

DX: * FAMILIAL PERIODIC PARALYSIS

DX: * NEUROMUSCULAR PARALYSIS

DX: * §

IN DESCRIBING YOUR MANAGEMENT PLAN FOR ED HARRISON, YOU WILL BE ASKED TO INCLUDE THE FOLLOWING INFORMATION:

1. MEDICATIONS (USING GENERIC NAMES FOR DRUGS WHEN POSSIBLE;
DOSAGES AND METHOD OF ADMINISTRATION ARE NOT NECESSARY)
2. PROCEDURES, REFERRALS AND/OR CONSULTATIONS (INCLUDE
HOSPITALIZATION HERE, IF NECESSARY)
3. INSTRUCTIONS TO THE PATIENT

** NOTE - YOU ARE EXPECTED TO GIVE MANAGEMENT STEPS ONLY FOR THE SHORT-TERM CARE OF THIS PATIENT.**

LIST ONLY ONE DRUG, PROCEDURE, INSTRUCTION ON EACH LINE AND HIT THE RETURN KEY AT THE END OF EACH LINE. WHEN YOU HAVE COMPLETED A SECTION, TYPE A DOLLAR SIGN (\$).

MEDICATION: * IV POTASSIUM CHLORIDE

MEDICATION: * IV RINGERS

MEDICATION: * §

PLEASE LIST THE PROCEDURES, REFERRALS AND/OR CONSULTATIONS YOU WOULD RECOMMEND FOR ED HARRISON.

PROCEDURE: * HOSPITALIZE

PROCEDURE: * MONITOR POTASSIUM INTAKE

PROCEDURE: * REPEAT EKG

PROCEDURE: * REFER TO NEUROLOGY

PROCEDURE: * §

PLEASE LIST ANY INSTRUCTIONS YOU WOULD GIVE THE PATIENT REGARDING HIS RESPONSIBILITIES IN THE MANAGEMENT OF HIS HEALTH PROBLEMS.

INSTRUCTION : * COME TO SEE ME IN A WEEK AFTER DISCHARGE

INSTRUCTION : * §

SCORES AND FEEDBACK

(Note: At this point the CASE is complete and the user receives feedback on his/her performance.)

YOUR SCORE FOR DIAGNOSTIC CORRECTNESS: 100

AUTHOR'S DIAGNOSTIC STATEMENT	VALUE	VALUE OBTAINED
1. HYPOKALEMIA	40	40
2. NEUROMUSCULAR PARALYSIS SECONDARY TO HYPOKALEMIA	40	40
3. FAMILIAL PERIODIC PARALYSIS	20	20

YOUR SCORE FOR MANAGEMENT: 75

AUTHOR'S SUGGESTED MANAGEMENT	VALUE	VALUE OBTAINED
1. MEDICATION	70	<i>60</i>
A. IV POTASSIUM CHLORIDE	60	<i>60</i>
B. IV HYDRATION	10	0
2. PROCEDURES, REFERRALS, CONSULT	15	0
A. HOSPITALIZATION - EKG MONITORING & FOLLOW SERUM POTASSIUM	15	10
B. CONSULT NEUROLOGY	0	0
3. INSTRUCTIONS TO THE PATIENT	<i>15</i>	<i>5</i>
A. AVOID HIGH CARBOHYDRATE MEALS	10	0
B. FOLLOW-UP (COME IN A WEEK OR LESS AFTER DISCHARGE)	5	<i>5</i>

DR. STEPHEN M. FRIES (UNIVERSITY OF MICHIGAN), AUTHOR OF THE ED HARRISON CASE, FEELS THE FOLLOWING HISTORICAL INFORMATION AND PHYSICAL AND LABORATORY TESTS ARE CRITICAL FOR THE DIAGNOSIS AND MANAGEMENT OF THIS CASE.

PLEASE PRESS THE RETURN KEY TO CONTINUE . . . *

**** HISTORY ****

(Note: A notation is made beside each of the author's critical concepts as to whether the user did or did not obtain the information.)

CANNOT MOVE BUT ABLE TO TALK - OBTAINED
SPEECH SLURRED - OBTAINED
DROOLING - OBTAINED
MEDICATIONS - OBTAINED
SEIZURE HISTORY - OBTAINED
PAST HOSPITALIZATIONS - OBTAINED
FAMILY HISTORY OF MEMBERS DYING IN SLEEP - OBTAINED
FAMILY HISTORY OF PARALYSIS - NOT OBTAINED
ACCIDENT OR INJURIES - OBTAINED
COORDINATION PROBLEMS-OBTAINED
EYESIGHT DIFFICULTIES - OBTAINED
PSYCHIATRIC problems- OBTAINED
INJECTION OF HIGH CARBOHYDRATE MEAL PRIOR TO ONSET - NOT OBTAINED

**** PHYSICAL EXAM ****

PULSE - OBTAINED
RESPIRATION - OBTAINED
CHEST PERCUSSION - OBTAINED
HEART INSPECTION - OBTAINED
HEART PALPATION - OBTAINED
HEART AUSCULTATION - OBTAINED
EXTREMITIES - OBTAINED
CRANIAL NERVES - OBTAINED
MOTOR SYSTEM - OBTAINED
CEREBELLA TESTS - NOT OBTAINED
GAIT - OBTAINED
MUSCLE STRENGTH - OBTAINED
VIBRATORY, POSITIONAL, TEMPERATURE, TOUCH AND PAIN SENSATION - NOT OBTAINED
BABINSKI REFLEX - OBTAINED

**** LABORATORY ****

SERUM ELECTROLYTES - OBTAINED
EKG - OBTAINED

THERE ARE A NUMBER OF TESTS IN THE LABORATORY SECTION THAT WOULD BE CONSIDERED DANGEROUS OR UNNECESSARY TO PERFORM ON THIS PATIENT BECAUSE OF HIS CONDITION. YOU REQUESTED NONE OF THESE.

THE TOTAL COST OF TESTS YOU ORDERED IN THE LABORATORY SECTION IS 66 DOLLARS.

THERE ARE TWO LABORATORY TESTS WHICH SHOULD BE ORDERED FOR EVERY PATIENT YOU SEE FOR THE FIRST TIME. THESE TESTS ARE THE URINALYSIS AND COMPLETE BLOOD COUNT. YOU REQUESTED BOTH OF THESE.

DO YOU DESIRE PRINTED EVIDENCE THAT YOU HAVE COMPLETED THE FOREGOING CASE SO THAT YOU MAY OBTAIN CONTINUING EDUCATION CREDIT? (YES/NO)

* Y

IN ORDER TO VALIDATE YOUR COMPLETION OF THIS ACTIVITY, WE MUST MAINTAIN A RECORD OF YOUR NAME, DATE, AND CASE COMPLETED.

PLEASE ENTER YOUR FIRST AND LAST NAME AT THIS TIME (NO MIDDLE NAME OR INITIAL).
EXAMPLE: JOHN DOE (PLEASE REMEMBER TO PUT A SPACE BETWEEN YOUR FIRST AND LAST NAMES.)

* EARLA MYER

EARLA MYER, IS YOUR NAME ENTERED CORRECTLY - NO MIDDLE NAME OR INITIAL? (YES/NO)

* Y

5/01/79

EARLA MYER HAS COMPLETED CASE 16, ED HARRISON.

THIS IS A CAI PROGRAM OFFERING OF THE OHIO STATE UNIVERSITY COLLEGE OF MEDICINE DIVISION OF COMPUTING SERVICES FOR MEDICAL EDUCATION AND RESEARCH. AS AN ORGANIZATION ACCREDITED FOR CONTINUING MEDICAL EDUCATION, THE OHIO STATE UNIVERSITY COLLEGE OF MEDICINE CENTER FOR CONTINUING MEDICAL EDUCATION CERTIFIES THAT THIS CONTINUING MEDICAL EDUCATION OFFERING MEETS THE CRITERIA FOR UP TO 1.5 CREDIT HOURS IN CATEGORY I OF THE PHYSICIAN'S RECOGNITION AWARD OF THE AMERICAN MEDICAL ASSOCIATION PROVIDED IT IS USED AND COMPLETED AS DESIGNED.

ALL PARTICIPANTS ARE REMINDED TO LIST THE TOTAL HOURS SPENT USING THIS CASE (UP TO 1.5 HOURS) IN THEIR INDIVIDUAL LOG AND TO NAME THE OSU COLLEGE OF MEDICINE CCME AS CO-SPONSOR.

(Note: Record of participation is provided for continuing education credit.)
