# OPERATION, STAFFING AND DESIGN FOR TRAUMA CARE IN A UNIVERSITY HOSPITAL SETTING

## INTRODUCTION

WHEN ONE WISHES TO DISCUSS THE OPERATION STAFFING AND DESIGN FOR TRAUMA CARE AND WHEN ONE REALIZES THAT IN THE BEGINNING THERE WAS NO ESTABLISHED GUIDELINE WHEREIN TO SEEK DIRECTION FOR A PROGRAM IN TRAUMA CARE - ONE GENERALLY THEN DRAWS UPON HIS OWN EXPERIENCE IN DESCRIBING THE EVOLUTION OF HIS TRAUMA CENTER. TODAY I WISH TO SHARE WITH YOU 15 YEARS EXPERIENCE IN DEVELOPING A SYSTEM OF TRAUMA CARE AS WAS DEVELOPED IN A UNIVERSITY ENVIRONMENT.

FIRST, I SHALL TELL YOU OF THE TYPE OF PATIENTS WHICH BELONG IN A TRAUMA CENTER AND WHY - (THE GOLDEN HOUR), ALSO THE PARTS NECESSARY FOR A TRAUMA CENTER, HOW IT SHOULD OPERATE AS WELL AS THE RESPONSIBILITIES AND FUNCTIONS NECESSARY TO ESTABLISH A GOOD CENTER.

SECONDLY, - I WILL DISCUSS THE TYPE OF STAFFING AND PATTERNS OF STAFFING THAT WE USE AND ARE NEEDED SO THAT THE TRAUMA CENTER CAN FUNCTION SMOOTHLY AT ALL TIMES AND UNDER ALL CIRCUMSTANCES. IF TIME PERMITS, I WILL TELL WHY NEW KINDS OF STAFFING PATTERNS ARE NEEDED.

THIRDLY - SOMETHING WILL BE SAID ABOUT DESIGNING A TRAUMA CENTER - WHERE IT SHOULD BE OR NOT BE. WHAT

OTHER PARTS AND ANCILLARY SERVICES ARE NEEDED TO PROVIDE EXCELLENCE IN TRAUMA CARE.

FINALLY, WE WILL REVIEW BRIEFLY THE DIFFICULTIES ASSOCIATED IN ESTABLISHING A TRAUMA CENTER IN A UNIVERSITY SETTING. AND AT THE SAME TIME OFFER A WORD OF CAUTION TO PHYSICIANS AND HOSPITAL ADMINISTRATORS AS WE LOOK AT THE WHOLE SPECTRUM OF TRAUMA CARE.

IN THE BEGINNING, OUR AIMS AND GOALS WERE TO DEVELOP A TRAUMA CENTER PROGRAM THAT WOULD:

1. PROVIDE EXCELLENCE IN CARE AT ALL LEVELS
2. MOVE PATIENTS AS LITTLE AS POSSIBLE
3. DEVELOP STANDARDS OF THERAPY FOR TEACHING AND RESEARCH
4. DISSEMINATE KNOWLEDGE IN TRAUMA CARE
5. PROVIDE SYSTEMS OF CARE

FINALLY, A MAJOR GOAL - WHEN THE TIME HAS FINALLY COME WHERE KNOWLEDGE, KNOW-HOW AND EQUIPMENT COME TOGETHER TO MAKE THE SYSTEM OF TRAUMA CARE POSSIBLE.

THE GOAL

SLIDE 1 EMS TRAUMA CENTER GOAL

ANY CITIZEN OR TRANSIENT IN THE STATE OF MARYLAND HAS THE RIGHT TO THE BEST MEDICAL CARE ACCORDING TO THE STATE OF THE ART AND NOT ACCORDING TO LOCATION, SEVERITY, AND EXTENT OF INJURY.

SLIDE 2 OF WHOM ARE WE SPEAKING?

1. THREE KINDS OF PATIENTS
2. CONCERNED WITH THE PATIENT WITH THE LIFE-THREATENING PROBLEM WHETHER ILLNESS OR TRAUMA
3. THESE ARE THE PEOPLE WHO TRADITIONALLY DIE - THEY ARE THE 5% IN TRAUMA - OTHERS CAN BE EASILY TREATED ELSEWHERE.

SLIDE 3 CRITERIA FOR PATIENT ADMISSION

1. SEVERE MULTIPLE INJURIES (TWO OR MORE SYSTEMS)
2. HEAD AND SPINAL CORD INJURIES
3. CARDIAC AND MAJOR VESSEL INJURIES
4. CARDIOGENIC SHOCK, UNCONTROLLED
5. MULTIPLE INJURIES WITH COMPLICATIONS: E.G., SHOCK, SEPSIS, RESPIRATORY FAILURE, CARDIAC FAILURE, ALCOHOL AND DRUG OVERDOSE
6. SEVERE FACIAL AND EYE INJURIES
7. BURNS, GAS GANGRENE, POISONING, CARBON MONOXIDE, SCUBA ACCIDENTS, DROWNING

SLIDE 4 MIEM PROGRAM

1. PERFUSION AND OXYGEN DEFICITS - THE TAKER OF ALL LIFE HYPOXIA
2. GOLDEN HOUR
3. 3 R's

SLIDE 5 EXTENDING HAND BY BRINGING PATIENT IN RAPIDLY AND EFFICIENTLY - NOT BY USING LARGE MOBILE UNIT VANS WHICH WASTE PERSONNEL AND TIME IN TREATING THE PATIENT AT THE SCENE:
THEREFORE, WE TRADE SPEED FOR STABILIZATION.

OPERATION OF A TRAUMA CENTER IN A UNIVERSITY SETTING

IT SEEMS TO BE THE PRESENT TREND TO ROPE OFF AN AREA IN AN EMERGENCY ROOM OR IN AN INTENSIVE CARE UNIT AND CALL IT A TRAUMA CENTER. IN A UNIVERSITY SETTING, SUCH A CONCEPT IS DEPLORABLE. IMMEDIATE LABORATORY, X-RAY, O.R. AND BLOOD BANK SUPPORT IS PARAMOUNT. IN ADDITION IMMEDIATE AVAILABILITY OF SEASONED SPECIALISTS EXPERIENCED IN WORKING WITH TRAUMA PROBLEMS IS MANDATORY OTHERWISE ONE IS SIMPLY PROVIDING SOME TYPE OF GLORIFIED EMERGENCY ROOM CARE WHICH HAS NOT PROVEN ITSELF IN THE LAST 30 YEARS. IF THE SAME CORRAL IS INSTALLED IN AN ICU YOU HAVE A GLORIFIED ICU BUT NOT A TRAUMA CENTER. WHY? TRAUMA CENTERS AND ICU'S ARE DIFFERENT!

SLIDE 6 LASSO CONCEPT

SLIDE 7 COMPONENT FACILITIES

CRITICAL PATIENTS CAN NOT BE MOVED SO ALL FACILITIES MUST COME TO THE PATIENT. OUR EXPERIENCE OVER THE PAST 15 YEARS DICTATED OTHERWISE. THE TRAUMA CENTER ICU CONCEPT.

SLIDE 8 TRAUMA CENTER PHILOSOPHY

TRAUMA CENTER VS. INTENSIVE CARE UNIT

EACH DIFFER IN MISSION AND RESPONSIBILITY

1. I.C.U. - IN-HOSPITAL TRANSFER

   ALREADY - DIAGNOSED
   EVALUATED
   FURTHER RX NECESSITATES INTENSIVE CARE

2. TRAUMA CENTER - A COMBINED FIRST CONTACT EMERGENCY DEPT. AND I.C.U.

   PATIENT - ARRIVES UNDIAGNOSED AND UNTREATED
   DIRECT FROM OUTSIDE HOSPITAL COMPLEX
   DEMANDS VARIETY OF:
   RESUSCITATIVE, DIAGNOSTIC AND THERAPEUTIC MEASURES FOR SURVIVAL

SLIDE 9 RESPONSIBILITY AND FUNCTION

A UNIVERSITY TRAUMA CENTER DIFFERS FROM A COMMUNITY HOSPITAL IN A NUMBER OF WAYS SOME OF WHICH ARE LISTED HERE. ON THE OTHER HAND A COMMUNITY HOSPITAL DOES NOT HAVE THE TYPE

OF RESPONSIBILITY THAT I AM GOING TO ELICIT BECAUSE ESSENTIALLY FOR THE COMMUNITY HOSPITAL, THE KEY WORD IS SERVICE!

1. NEW CONCEPTS IN PATIENT CARE

   PRIMARY NURSE PROGRAM

   SURGICAL TEAM CARE

   COMPONENT TRANSFUSION THERAPY

   IMMEDIATE OPERATION ROOM CAPABILITY

   ON-SIGHT RADIOLOGICAL STUDIES INCLUDING CONTRAST MEDIA

   REHABILITATION AND FAMILY CRISIS INTERVENTION

2. NEW CONCEPTS IN TEACHING

   TRAUMATOLOGY - CRITICAL CARE MEDICINE - CRITICAL CARE NURSING - THE PRIMARY NURSE

   COMBINATION BEDSIDE AND SIT DOWN ROUNDS WITH THE DOCTOR/TEAM LEADER AND PRIMARY NURSE

   PROBLEM ORIENTED RECORDS

   TUTORIALS - RESIDENT ROTATION RESPONSIBILITY

   AUDIOVISUAL PROGRAMS

   PARAMEDIC AND EMT TRAINING

   PHYSICIAN AND NURSE TRAINING THROUGHOUT THE STATE AND INSTITUTE BY TEAMS GOING OUT AND STUDENTS COMING IN.

3. RESEARCH

THE INJURED CELL

BIOCHEMISTRY

PATHOLOGY

BACTERIOLOGY

ORGAN RESEARCH

LUNG - SHOCK LUNG

KIDNEY

LIVER

HEAD

IMMEDIATE AUTOPSY - TOTAL RESEARCH

PROGRAM WITH DEPT. OF PATHOLOGY

MEDICAL EXAMINER'S PROGRAM

PREDICTABILITY PATTERNS IN INJURY

4. SPECIALTY REFERRAL CENTERS - NOT PLANNED

BUT OF NECESSITY

TRAUMA
BURNS
SPINAL CORD
CARDIAC - SOPHISTICATED RX
PSYCHIATRIC
ALCOHOL AND DRUG OVERDOSE
HAND CENTER

STAFFING IN A UNIVERSITY TRAUMA CENTER - WHAT ABOUT STAFFING?

IMMEDIATE AVAILABILITY OF SEASONED CLINICIANS, NURSES AND EXPERTS ARE THE ORDER OF THE DAY. ONE CAN NOT

TAKE CARE OF THE EMERGENCY CRITICALLY ILL AND INJURED WITH THE TRADITIONAL HEN PICKING ORDER THAT WE SEE IN MOST UNIVERSITY PROGRAMS WHO HAVE A "TRAUMA CENTER."

TO BE ABLE TO UNDERSTAND STAFFING, LET US FIRST LOOK AT PATIENT FLOW PATTERNS IN A TRAUMA CENTER. FIRST THE TEAM CONCEPT.

SLIDE 10 TEAM CONCEPT

ABOLITION OF COMMITTEE MEDICINE

1. TEAM MANAGES RESUSCITATIVE PHASE (TREAT BEFORE DIAGNOSIS)
2. STABILIZATION PHASE
3. CONSULTATION GROUP ROLE
4. HOWEVER, ALWAYS ONLY ONE TEAM MANAGER
5. TEAM SPECIALTY SURGERY
6. PATIENT ALWAYS UNDER CONTROL OF MEDICAL DIRECTOR WHILE IN CENTER

SLIDE 11 MULTIPLE TRAUMA - THE OBJECT OF CARE - TO HANDLE ALL PROBLEMS

FIRST, LET'S LOOK AT

SLIDE 12 MIEM PATIENT FLOW

SECOND, LET'S LOOK AT

SLIDE 13 MIEM MANAGEMENT FLOW

FINALLY, HOW LONG ARE PATIENTS IN THE VARIOUS TRAUMA CENTER AREAS

SLIDE 14 MIEM PATIENT FLOW IN DAYS

ADMITTING AREA TO: $5\frac{1}{2}$ DAYS

1. OPERATION ROOM
2. CRITICAL CARE RECOVERY UNIT
3. STAY IN ADMITTING AREA FOR OPERATION

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4. INTENSIVE CARE UNIT (5-10 DAYS)
5. GENERAL HOSPITAL BED (20 DAYS)
6. REHABILITATION CENTER (1-6 MO)

EVEN THE ABOVE STAFFING CONCEPTS ARE CHANGING.

SLIDE 15 CONCEPT DIFFERENT NOW - SPECIALTY CENTERS

SLIDE 16 MIEM STAFFING - 1975

SLIDE 17 MIEM TEAM COMPOSITION

SLIDE 18 MIEM NURSE STAFFING PATTERNS

SLIDE 19 TRAUMA CENTER STAFFING AND OPERATION

SLIDE 20 STAFFING COMPONENT - IN PLANNING A TRAUMA FACILITY - IN SUMMARY - WE MUST HAVE STAFF FOR:

1. IMMEDIATE AVAILABILITY OF MULTIDISCIPLINARY STAFF
2. ONE MEDICAL DIRECTOR
3. TRAUMA PHYSICIAN TEAM
4. NURSES TRAINED AT ALL LEVELS OF EMERGENCY CRITICAL CARE
5. EDUCATION/TRAINING PROGRAMS

CONCEPTS IN DESIGN

NOW, LET US LOOK AT CONCEPTS IN DESIGN - FIRST, WHAT IS THE MIEM DESIGN CONCEPT?

SLIDE 21 MIEM DESIGN CONCEPT

1. MUST BE A FIRST CONTACT FACILITY PREPARED TO ADMIT AND TREAT EMERGENCY PATIENTS ON MINIMAL NOTICE.

2. MUST PROVIDE IMMEDIATE CARE TO MEET THE MOST ACUTE AND DIFFICULT SITUATION AND CONTINUE TO PROVIDE SUCH CARE UNTIL PATIENT'S CONDITION STABILIZES.

IF THE UNIT IS DESIGNED AND EQUIPPED PROPERLY, THE PATIENT WILL BE MET BY A COMPETENT STAFF WHO WILL INITIATE RESUSCITATION, STABILIZATION, DIAGNOSIS AND TOTAL CARE.

SLIDE 22 PHYSICAL COMPONENTS - WHAT ARE SOME OF THE PHYSICAL COMPONENTS NECESSARY IN PLANNING OF A TRAUMA FACILITY?

1. SEPARATE ADMITTING AREA ADJACENT TO E.D.
2. SPECIAL CRITICAL CARE UNIT
3. IMMEDIATE O.R. CAPABILITY AND AVAILABILITY
4. ANCILLARY SUPPORT
5. PATIENT FLOW TO OTHER HOSPITAL AREAS

SLIDE 23 MIEM TOTAL SUPPORT SYSTEM (A DIAGNOSTIC LOOK)

SLIDE 24 CRITICAL CARE RECOVERY UNIT (WHY THIS DESIGN) 1962

SLIDE 25 WHEEL CONCEPT

SLIDE 26 PODIUM - MIEM DESIGN CONCEPT

SLIDE 27 PDOIUM CONCEPT

SLIDE 28 PODIUM STORAGE

SLIDE 29 MIEM CCRU CUBICLE

SLIDE 30 CCRU WITH STEP DOWN CARE UNITS

SLIDE 31 ADMISSION AREA

SLIDE 32 OPERATION ROOM

SLIDE 33 DIFFICULTY IN ESTABLISHING A TRAUMA FACILITY

1. PERSONNEL (NURSES, PHYSICIANS, TECHNICIANS)
2. PATIENT CONTROL
3. ADMINISTRATIVE SUPPORT (HOSPITAL, UNIT)
4. FUNDING (LOCAL, FEDERAL)
5. STIGMA OF CLINICAL RESEARCH

MANY OF US SPEAK OF THE POOR QUALITY OF EMERGENCY CARE DURING THE PRE-HOSPITAL PHASE: HOWEVER, WE SHOULD NOT CRITICIZE THE QUALITY OF CARE PROVIDED IN THAT EXTRA HOSPITAL FACET BECAUSE THIS PROBLEM HAS BEEN ACKNOWLEDGED BY HEW's DIVISION OF EMERGENCY MEDICAL SERVICES AND WILL SOON BE UNDER CONTROL.

WHAT I AM CONCERNED ABOUT IS THE QUALITY OF CARE GIVEN ONCE THAT PATIENT ARRIVES IN THE HOSPITAL BECAUSE I AM SURE THAT <u>IN MOST HOSPITALS</u> THE EMERGENCY VICTIM BECOMES, FOR VARIOUS REASONS, THE UNWANTED GUEST. HE INTERFERES WITH THE HOSPITAL ROUTINE OF THE DAY, THE OPERATION ROOM ELECTIVE SCHEDULE, THE BLOOD BANKS, WORKLOADS - EVERYTHING. PHYSICIANS AND

HOSPITAL ADMINISTRATORS DON'T SEEM TOO CONCERNED, HOWEVER, OR THIS DILEMMA WOULD NEVER HAVE HAPPENED: THEREFORE, AT THAT HOSPITAL THAT PATIENT PAYS FOR THE PROGRAM WITH HIS LIFE.

SLIDE 33 EMS GOAL