A STUDY OF PEDIATRIC EMERGENCY
ROOM UTILIZATION AND IMPLICATIONS AT
REYNOLDS ARMY COMMUNITY HOSPITAL
FORT SILL, OKLAHOMA

A Graduate Research Project
Submitted to the Faculty of
Baylor University

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In Partial Fulfillment of the
Requirements for the Degree
of
Master of Health Care Administration

by

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6 May 1983
This study examined the usage of the pediatric emergency room to determine the optimum method of providing emergency services. Seven reasons were identified for children using the emergency room services when they do, primarily based on parent availability. This study recommended changes to the pediatric services to improve the overall service to the customer. Particular emphasis was made on educating the parents on the alternative service of same day appointments to reduce emergency room usage for nonemergencies.
ACKNOWLEDGMENTS

The project officer wishes to express his appreciation to the following individuals, without whose advice and assistance this study could not have been done:

CPT Frank B. Parks, MC, CIC, Emergency Room; SFC Kenneth E. Taylor, NCOIC, Emergency Room; Tisha Burres, DAC, Pediatric Medical Clerk; Kay Craig, DAC, Executive Secretary; Rita F. Brethower, DAC, Secretary, Clinical Support Division; and COL Ronald Jones, MSC, Executive Officer, Reynolds Army Community Hospital.
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<td>16</td>
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I. INTRODUCTION

PROBLEM DEVELOPMENT

There has been an increase in the demand for emergency room (ER) services, greater than other ambulatory services, since the late 1950's. For this reason, health care managers have directed increased attention to the role of the ER. Hospital emergency rooms are being utilized by an increasing proportion of patients for the provision of non-urgent care of conditions traditionally brought to primary care physicians.

In effect, the ER in many cases is taking on the role of family physician.

These same trends have taken place at Fort Sill, Oklahoma. Reynolds Army Community Hospital serves a population of approximately 66,000, which includes active military, dependents, and retired personnel. The hospital is presently operating at an authorized 166 beds, with a daily outpatient load from 1,100 to 1,500 visits. The outpatient visits to the ER for FY 1982 have been approximately 4,100 visits per month as compared to 3,600 visits per month in FY 1981.

The defined purpose of the ER at Reynolds Army Community Hospital (RACH) is to provide emergency medical care to save life, limb or prevent undue or prolonged suffering. It is stressed to patients, through the use of an ambulatory patient care information booklet which is included in the Fort Sill Welcome Packet, that the ER should not be used as an after-duty-hours outpatient or pediatric clinic for the treatment of minor problems. It is further emphasized that due to the current shortages of medical
personnel, staffing to provide other than emergency care is very limited. It is the hospital's policy that all personnel reporting to the ER will be evaluated, unless they leave before being seen. Waiting time is the cost a patient pays for utilizing the ER for minor non-emergency medical problems. Waiting time varies, depending on the ER workload, and has been reported in excess of six hours.

The ER is operated based on a three 8-hour shift schedule commonly referred to as days, evenings, and nights. It has been observed, by monitoring daily numbers of patients per shift for twelve weeks, that a trend of uneven distribution exists in the daily total number of patients treated per shift.

Many of the patients treated in the ER are children. During the hours that the Ambulatory Care Clinic (ACC) is operational (Monday-Friday, 0730-1630), patients over the age of 12 years with minor medical problems are directed to the ACC. Patients under the age of 12 years, reporting to the ER, are asked to make a same-day appointment (SDA) through central appointments for the pediatric clinic.

The uneven distribution of ER patients for the three shifts causes staffing problems, long waiting periods are experienced and at times patients feel frustrated and perceive they are being denied care. The ER's capability to render care would be enhanced if the numbers of patients per shift could be reduced. Alternative methods need to be developed to provide some of the services now being performed by the ER.

This study will focus on dependent children 12 years of age and less. The problem is to determine reasons why the children utilize ER services when they do. This will be done to determine the optimum method of providing the desired care within current resources for the children.
The research methodology for the problem consisted of literature review, perusal of ER logs, collection of data through the use of two questionnaires, and the analysis of the collected data to identify common trends and alternative methods. The first questionnaire, see Appendix A, allowed respondents to express their particular wants and perceptions in relation to the service. The questionnaire was given to the accompanying adult for completion in the pediatric clinic and ER waiting room. The completed questionnaires were turned in at the ER desk and the pediatric clinic's secretary's desk for collection. The second questionnaire, see Appendix B, was mailed to the Chiefs of Pediatric Services at thirty-one hospitals where Residents from the US Army-Baylor Program are located. The chiefs were requested to list current pediatric services and services they would like to see implemented at their facility. The Residents were asked to review the input for completeness and return the questionnaires by mail.

The data collected was utilized to define the common reasons for the current ER utilization trends among children 12 years and less, determine the implications, discuss alternative methods of providing the services to the child, and evaluate advantages and disadvantages of the present methods as well as the alternatives. The established criteria on which the alternatives were evaluated are:

1. Include policies which will tend to decrease the number of patients 12 years of age and less reporting to the ER which do not require immediate care.

2. Provide convenient operating hours for the users.

3. Be a same-day service.

4. Provide outpatient pediatric consultation services at all times.
5. Decrease waiting time to three hours or less in the ER.

The optimal solution is limited to one which can be supported utilizing current staffing levels and resources.

Currently at RACH, a pediatric patient can receive care from the pediatric clinic, a family practice physician, or the ER. Like most other military medical care facilities, appointments have to be scheduled weeks in advance due to the large volume of workload experienced. To provide more immediate care, same-day appointments are available and are scheduled using the central appointments system. When all the pediatricians and pediatric nurse practitioners are available, there are approximately 300 same-day appointments available per week in the pediatric clinic. The only source of pediatric care available after 1630 hours is that provided by the ER.

LITERATURE REVIEW

The literature review revealed that there has been very little research accomplished in the area of Emergency Room utilization and even less pertaining to pediatric patients. This finding was collaborated by Kleiman and Weitzman who both found the area to be bare of research.

It was evident in the few articles found, that there is the belief that ER's are being used primarily for the treatment of non-emergency conditions. Many of the researchers believed that the ER has become the primary care provider or at least a substitute for the primary care provider. Some believe the substitution is for the convenience of the physician and is backfiring because more people are growing up without forming a link with a primary care provider, making the ER the physician's competition.
Some researchers found that a major reason for ER utilization by adults and pediatric patients was their inability to access other alternative sources of care.\textsuperscript{23,24} Another found just the opposite view, that utilization of alternate sources of medical care and ties to the medical system through a regular primary care physician increased use of the emergency room.\textsuperscript{25} It may be part of today’s environment where everything stays open late for convenience and the ER is perceived as being there for one’s use.\textsuperscript{26} It was found that patients use the ER based on their view of the medical problem, even if it was a common cold.\textsuperscript{27} Another found, that for children, ER utilization was based more on the parent’s inability to assess the medical condition and there was a fear of the condition becoming worse.\textsuperscript{28} The inability to assess the problem appears to be more evident for younger children.\textsuperscript{29,30}

Some of the proposed methods for solving the current ER utilization problems found in the literature varied dramatically. To reduce ER utilization, Health Maintenance Organizations in certain areas have added on an additional charge for visits to the ER which were non-emergency in nature.\textsuperscript{31} Others have proposed that alternative sources of treatment be provided,\textsuperscript{32,33} such as Emergicenters. Many support the proper channeling of patients through the use of triage.\textsuperscript{34,35,36} Others believe the ER needs to be completely re-vamped so adequate staff, space, and equipment will be available to accommodate all those currently utilizing the ER.\textsuperscript{37,38}

The literature review provided this writer with an understanding of the inadequate amount of research done to try to determine why people utilize the ER. It did, however, provide the necessary background needed to develop the methodologies for this study.
FOOTNOTES


2. Ibid, p. 1033.


10. Weitzman, p. 964.

11. Yoder, p. 156.


17. Weitzman, p. 965.


20. Prepon, p. 58.


22. Prepon, p. 58.


24. Davidson, p. 123.


27. Stratmann, p. 1042.


30. Weitzman, p. 967.


38. Yoder, p. 160.
II. DISCUSSION

THE MACROSYSTEM

To assess the pediatric services provided by the military, pediatric services self-assessment questionnaires (Appendix B) were mailed to thirty-one military hospitals for completion by Chiefs of Pediatric Services. Thirty questionnaires were completed and returned. The responses were provided by one Air Force, three Navy, and twenty-six Army medical treatment facilities. The information obtained is summarized in Appendix D.

The questionnaire was utilized to evaluate the methods used at the medical facilities to provide and schedule outpatient pediatric services. For this reason, the sources were requested to provide:

- Hours of operation for outpatient pediatric clinic.
- If pediatric sick-call is provided, with hours.
- If pediatric walk-in services are provided during normal hours.
- If pediatric same-day appointments are provided, with approximate wait.
- If TMC's are utilized by pediatric patients.
- If patient screeners are utilized by pediatrics.
- If a separate pediatric emergency service is provided, with hours.
- Special pediatric services provided by the medical facility for outpatients.
- Special services provided by Post which support pediatric services.
- Special services the chief would like to see his facility provide.
The only response that every medical facility had in common was that a pediatrician was on-call for the ER at all times. This seems to be the minimum requirement for providing emergency care for pediatric patients. The ER physician is able to telephonically consult with the pediatrician and in an emergency can have the pediatrician report to the ER. The next most common response dealt with having a separate pediatric ER. Three of the respondents, 10%, indicated the medical facility provided the service and twenty-seven, 90%, did not. Of the ten areas of concern in the questionnaire, providing a separate pediatric emergency service requires the most resources, time and personnel. It is of interest to note that one of the three positive responses was from an Army medical activity, indicating the service can be provided by that size organization. Twenty-six medical facilities, 87%, indicated that Troop Medical Clinics (TMCs) were not utilized to treat pediatric outpatients. The four, 13%, utilizing TMCs have large military populations, Fort Bragg, Fort Benning, Fort hood, and Frankfurt, Germany. With the problems of limited space experienced by military medical facilities and large populations to support, better utilization of treatment space can be realized through the use of the TMCs for pediatric care. There are large blocks of time during the duty day when TMCs and their personnel are not efficiently utilized. These blocks of time can be used to schedule medical care for family members and as a minimum could be used as screening for same-day appointments to hospital clinics. Twenty-six of the medical facilities, 87%, indicated the use of same-day appointments for pediatric care. Only thirteen of the twenty-six, 50%, indicated that screeners were used by the pediatric clinic, thus opening the same-day appointment system to possible abuse. These results are better than overall where only 43% utilize screeners. This indicates that with the same-day appointment system there has been a realization
that screening is necessary. Eighteen of the medical facilities, 60%, indicated that pediatric sick-call hours were scheduled for their patients. Of these facilities, nine or 50%, indicated that walk-in service was not allowed. Only nine facilities provided pediatric sick-call on a walk-in basis. Six other medical facilities allowed walk-in pediatric service, for a total of fifteen facilities providing walk-in service or 50% of the surveyed medical facilities. Four of the medical facilities, 13%, provide weekend pediatric clinics; three, 10%, have evening hours (2030 and later); one, 3%, has a pediatrician in the ER (Mon-Sat) combined with 10% that have separate pediatric ERs indicates that 36% of the medical facilities provide pediatric services beyond those associated with the normal duty day, i.e. 0730-1630. Special services provided to pediatric outpatients by the medical facilities, special post services provided in support of outpatient pediatric care and outpatient pediatric care needs, as indicated by the chiefs of the pediatric services, are summarized in Appendix D.

THE MICROSYSTEM

To assess the pediatric outpatient services provided by Reynolds Army Community Hospital (RACH), patient questionnaires were provided in the pediatric clinic and the Emergency Room (ER). A total of 323 questionnaires, 131 from the ER and 192 from the pediatric clinic, were completed and evaluated. The results are summarized in Tables 1 and 2. The questionnaires (Appendix A) were developed to solicit the patient escort's perception of the current method of providing care, solicit suggestions for improvement of the current system, and to look for trends in why pediatric patients utilize the ER.
<table>
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<th>Results from PEDs Questionnaire</th>
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<td>Number</td>
<td>Decimal Fraction</td>
<td>Number</td>
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<tr>
<td>Aware of the same-day appointment (SDA)</td>
<td>86</td>
<td>.66</td>
<td>140</td>
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<tr>
<td>Not aware of SDA</td>
<td>45</td>
<td>.34</td>
<td>52</td>
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<td>Aware of SDA and used it</td>
<td>76</td>
<td>.88</td>
<td>130</td>
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<tr>
<td>Aware of SDA but have not used it</td>
<td>10</td>
<td>.12</td>
<td>10</td>
</tr>
<tr>
<td>SDA waiting time was reasonable</td>
<td>53</td>
<td>.70</td>
<td>130</td>
</tr>
<tr>
<td>SDA waiting time was fairly long</td>
<td>15</td>
<td>.20</td>
<td>8</td>
</tr>
<tr>
<td>SDA waiting time was very long</td>
<td>8</td>
<td>.11</td>
<td>1</td>
</tr>
<tr>
<td>Have used Emergency Room (ER)</td>
<td>131</td>
<td>1.00</td>
<td>158</td>
</tr>
<tr>
<td>Have not used ER</td>
<td>0</td>
<td>.00</td>
<td>34</td>
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<tr>
<td>ER waiting time was reasonable</td>
<td>46</td>
<td>.35</td>
<td>49</td>
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<tr>
<td>ER waiting time was fairly long</td>
<td>32</td>
<td>.24</td>
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<tr>
<td>ER waiting time was very long</td>
<td>53</td>
<td>.40</td>
<td>76</td>
</tr>
<tr>
<td>Would have used SDA instead of ER if could get SDA</td>
<td>92</td>
<td>.70</td>
<td>156</td>
</tr>
<tr>
<td>Would not have used SDA instead of ER</td>
<td>39</td>
<td>.30</td>
<td>36</td>
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<td>Questionnaire</td>
<td>Results from ER Questionnaire</td>
<td>Results from PEDs Questionnaire</td>
<td>Combined Results</td>
</tr>
<tr>
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<td>-------------------------------</td>
<td>---------------------------------</td>
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</tr>
<tr>
<td></td>
<td>Decimal Number</td>
<td>Fraction</td>
<td>Decimal Number</td>
</tr>
<tr>
<td>Not aware of SDA that would have used SDA instead of ER</td>
<td>33</td>
<td>.73</td>
<td>41</td>
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<td>Not aware of SDA that would not have used SDA instead of ER</td>
<td>9</td>
<td>.20</td>
<td>2</td>
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<td>Not aware of SDA and did not respond to Questionnaire</td>
<td>3</td>
<td>.07</td>
<td>9</td>
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<tr>
<td>Ability to bring problem to medical attention ASAP</td>
<td>105</td>
<td>.80</td>
<td>166</td>
</tr>
<tr>
<td>Working parents not able to bring problem to medical attention ASAP</td>
<td>14</td>
<td>.11</td>
<td>10</td>
</tr>
<tr>
<td>Not able to bring problem to medical attention ASAP due to other reasons</td>
<td>12</td>
<td>.09</td>
<td>16</td>
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<tr>
<td>Total not able to bring problem to medical attention ASAP</td>
<td>26</td>
<td>.20</td>
<td>26</td>
</tr>
<tr>
<td>Transportation was a problem getting to hospital</td>
<td>20</td>
<td>.15</td>
<td>15</td>
</tr>
<tr>
<td>Have not used ER but have used SDA</td>
<td>0</td>
<td>.00</td>
<td>21</td>
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</table>

*Adjusted for no response to question
TABLE 2/PATIENT QUESTIONNAIRE RESULTS (NARRATIVE)

I. EMERGENCY ROOM SURVEY.
- Have on-call Pediatrician for ER.
- Have more Pediatricians in ER.
- Provide walk-in pediatric sick call.
- Triage and prioritize ER patients.
- Priority should be given to infants and children in ER.
- Increase the ER staff.
- Evening walk-in Pediatric Clinic (1700-2000).
- Get more nurses for ER.
- Improve Central Appointment System so you can get a Same-Day Appointment (more telephone lines and people).
- Provide more space and physicians for the ER.
- Have a separate minor emergency clinic.
- Bring in another physician to ER when an emergency case comes in.
- Physicians need to explain the child’s condition to the parent better.
- Change the hours of the Pediatric Clinic, later hours.
- Get out more information on the transportation available to hospital.
- Keep the TMC’s open later to reduce the ER workload.
- Make same-day appointments through the Pediatric Clinic, not CAS.
- Make more same-day appointments available.
- Have AMIC open later at night.
- Have Pediatrics open on Saturday, 1/2 day.
- Pediatrician full time in ER.
- Separate waiting area for children.
- Children should be seen before adults with same condition.

II. PEDIATRIC CLINIC SURVEY.
- See same physician (Peds) each visit.
- Improve Medical Records system, time to pick them up.
- Improve politeness of ER staff.
- More SDA.
- Make SDA through Peds Clinic
- Don’t schedule Peds appointments before 0900.
- Get more Pediatricians.
- Have Pediatrician on call for ER.
- Have Pediatrician in ER 1700-2200.
- Try to decrease waiting times.
- Night Peds clinic.
- Make appointments through clinic.
- ER should take patients based on how sick they are, not by when they come.
- Physicians covering ER need Peds training; they treat children roughly and scare them.
- CAS needs more telephone lines and people.
- Ability to schedule return visit through clinic, not CAS.
- Play area for waiting children in Peds.
- Have AMIC operate until 2100.
- Morning Peds Walk-In Clinic - Sick Call.
- Well Baby Clinic.
- Special Peds. ER.
- Weekend Peds Clinic.
- Need an area to change diapers in hospital.
- Have medical records of people with appointments at the clinic.
- Publicize SDA - get the word out.
- Advise over the telephone.
- More positive attitude of employees.
- More time for appointment.
- Assign Pediatricians by unit, family practice concept.
- More concerned attitude.
The ER log for the first week of February was analyzed to determine the distribution by age of patients visiting the ER. The curvilinear relationship is represented by Figure 1. For the population of children being evaluated, 12 years of age and less, 56% of the ER visits are for children less than 4 years of age. Of all the ER visits for the evaluated age group, 42% were brought to the ER for an elevated temperature or cold symptoms (Appendix C). This relates to the Kahn, et al. findings that 34% of the escorts were unable to identify the degree of severity of the child's illness and that 63% brought their child to the ER because they were concerned the condition was becoming worse.\(^1\) The age distribution depicted in Figure 1 also agrees with the Kahn, et al. finding that older children were more often thought to have come to the ER for appropriate reasons.\(^2\) The older the child, the more experience the parent has in diagnosing and determining appropriate utilization of emergency services. It was also noted that 56% of the escorts were in the pay grade of E-6 and above. This observation is in line with that of M. Kleiman who found that persons who have established ties with the health care system, have a regular provider and readily seek out medical care, are the most likely to utilize the ER.\(^3\)

This study was brought about due to the observed crowded conditions and suspected long waiting times experienced by pediatric patients in the ER of RACH. A study of the waiting times for the month of February 1983, for children age 12 years and less, was conducted (Table 3). The times recorded were the waiting times the escorts indicated they had waited in the ER prior to the child being seen. Of the 323 escorts surveyed, 289 indicated that they had utilized the ER (89% of the sample). As can be seen in Table 3, 31% of the pediatric patients wait three or more hours and 15% wait four or more
FIGURE 1/AGE DISTRIBUTION OF ER PATIENTS, 12 YEARS OF AGE AND LESS, TREATED MONDAY - FRIDAY*

*Info from 1st week, February 1983
TABLE 3/DISTRIBUTION OF ER WAITING TIME FOR CHILDREN 12 YEARS AND LESS

<table>
<thead>
<tr>
<th>Hours</th>
<th>ER Survey Decimal Number</th>
<th>Peds Survey Decimal Number</th>
<th>Combined Decimal Number</th>
<th>Cumulative Percentage</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Fraction</td>
<td>Fraction</td>
<td>Fraction</td>
<td></td>
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<tr>
<td>0-.49</td>
<td>10 .09</td>
<td>19 .13</td>
<td>29 .11</td>
<td>11</td>
</tr>
<tr>
<td>.5-.99</td>
<td>15 .14</td>
<td>20 .14</td>
<td>35 .14</td>
<td>25</td>
</tr>
<tr>
<td>1-1.49</td>
<td>16 .15</td>
<td>15 .10</td>
<td>31 .12</td>
<td>37</td>
</tr>
<tr>
<td>1.5-1.99</td>
<td>6 .06</td>
<td>15 .10</td>
<td>21 .08</td>
<td>45</td>
</tr>
<tr>
<td>2-2.49</td>
<td>20 .19</td>
<td>18 .12</td>
<td>38 .15</td>
<td>60</td>
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<tr>
<td>2.5-2.99</td>
<td>10 .09</td>
<td>13 .09</td>
<td>23 .09</td>
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<td>9 .08</td>
<td>15 .10</td>
<td>24 .09</td>
<td>78</td>
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<td>3.5-3.99</td>
<td>6 .06</td>
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<td>84</td>
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<td>4-4.49</td>
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<td>4.5+</td>
<td>7 .06</td>
<td>11 .07</td>
<td>18 .07</td>
<td>1.00</td>
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Information from February 1983
hours during a visit to the RACH ER. Only 45% of the pediatric patients are seen in less than two hours.

The waiting times and the percent seen in a block of time mean nothing without knowing the escort's perception of the ER wait. Escorts were asked to indicate, along with the time they had waited, their perception that the time waited was reasonable, fairly long, or very long. The results from those sampled in the ER and the pediatric clinic were similar. The combined results indicated that 32% perceived the wait as reasonable, 22% fairly long, and 44% very long. The indicated ER waiting times and the escort's perceptions were evaluated to determine if there was a relationship between them or if the results had no relationship. To evaluate the results, the chi-square test of independence using a .005 level of significance was performed, see Appendix E. The results indicated that the hours waited in the ER and the escort's perceptions were dependent. The calculated $X^2$ of 188.11 greatly exceeded the standard of 29.819, indicating a high degree of dependency. To better evaluate the relationships, histograms were made to compare the time waited in the ER and the escort's perceptions, see Appendix F. The relationships between ER waiting time and escort's perception are clearly evident in the histograms. It appears from the histograms that keeping the ER waiting time to two hours or less would greatly improve the perception of the services in the ER.

To determine the degree to which the pediatric patients contribute to the ER workload, the ER logs for the month of February 1983 were evaluated, see Appendix G. Children, 12 years and less, account for 36% of the ER's total workload. They account for 35% of the workload from 0001-0730 hours, 33% from 0731-1630 hours, and 39% from 1631-2400 hours. More important is
the fact that 49% of all the ER visits by children 12 years and less are between the hours of 1631-2400 and 58% are between 1631-0730 hours. This is compared to the Kahn, et al. finding that 62% of the pediatric visits were made between 1600 and 2359 hours. As noted by Kahn, more visits were made on Saturdays and Sundays than on weekdays.4

The escorts were questioned on their ability to bring their child’s condition to medical attention as soon as possible. This was done to determine if ER utilization was based on the escort’s inability to access the medical system. The combined results indicated that 83% of the escorts were able to bring their child’s condition to medical attention as soon as possible. It should be pointed out that only 80% of the escorts from the ER setting responded positively to this question as compared to 86% from the pediatric clinic, indicating more of an inability for those using the ER. It was found that of those escorts questioned in the ER, 20% were not able to bring their child’s condition to medical attention as soon as possible. Of these, 54% was due to both parents working or 11% of the total escorts questioned in the ER. This is compared to only 5% indicating a problem due to both parents working from those escorts questioned in the pediatric clinic. This indicates that two times more families with both parents working utilize the ER as their medical pediatric source than utilize the pediatric clinic. When asked if transportation had been a problem getting to the hospital, 15% of the escorts questioned in the ER indicated that transportation was a problem compared to 8% questioned in the pediatric clinic. This indicates that escorts with transportation problems are more inclined to utilize the ER for pediatric services than the pediatric clinic. The primary reasons given by the escorts for the transportation difficulties
were that the family had no automobile, the family had only one automobile and the husband drove it to work or the wife could not drive. The combined results indicate that 11% of all the escorts had transportation problems.

Like 87% of the other military medical facilities surveyed, listed in Appendix D, RACH has a same-day appointment (SDA) system for the pediatric clinic. The SDA system was initiated to provide same-day pediatric care for patients with minor illnesses and to reduce the ER workload. It is felt that if an escort can get a scheduled appointment with a pediatrician on the day of the child's medical condition, that the escort will be less likely to utilize the ER as the treatment source. To determine if a lack of knowledge about the SDA system contributed to ER utilization, escorts in the ER and the pediatric clinic were asked if they were aware of the SDA system. It was found that 73% of the escorts from the pediatric clinic and 66% from the ER were aware of the SDA system. Overall, 70% of the escorts were aware of the SDA option. Of those escorts aware of the SDA system, 38% of the escorts surveyed from the ER had utilized the SDA and 93% from the pediatric clinic. These high percentages indicate that knowing about the SDA system fosters its utilization. Of the 30% indicating they did not know about the SDA system, 87% indicated that they would have used the SDA instead of a visit to the ER if they had known about the SDA system for the pediatric clinic. This response indicates that if the escorts are made aware of the SDA system for the pediatric clinic, they will use it instead of the ER. It appears that getting the information about the SDA option out to the escorts will reduce ER utilization.

The escorts were asked if they would have used the SDA option instead of the visit to the ER, if they had known you could get an appointment the same day. The combined response from the ER and pediatric clinic indicated that 77% of the escorts would have used the SDA system instead of a visit to
the ER. Knowing you can get an appointment is the important point. The 23% that indicated that they would not have utilized the SDA were asked the reason why not. Their responses fell into three categories: 1. The child's condition was an emergency. 2. The child's condition developed after pediatric clinic hours or on the weekend. 3. Tried to make a SDA but none were available or couldn't get central appointments because the line was always busy. The escorts that had utilized the pediatric SDA were asked their perception of the waiting time. When looking at the combined results, 89% of the escorts indicated the waiting time was reasonable as compared to only 33% for an ER visit. It appears that if more of the escorts utilized the SDA option instead of an ER visit, escorts' perceptions of the pediatric care system would increase.

The escorts were also asked what would be the most convenient nine-hour block of time to them for operation of the pediatric clinic, see Table 4. Two blocks of time accounted for 91% of the responses, 63% for 0830-1730 hours and 28% for 0730-1630 hours.

SIGNIFICANCE

The survey of the macrosystem provided information about the methods utilized by other medical facilities to provide pediatric care. It is apparent, when comparing the methods utilized to provide pediatric services at Reynolds Army Community Hospital (RACH) with other methods found in the system, that RACH could be more innovative. Innovative in the sense that there are other methods that can compliment or supplement a pediatric clinic. The use of the family practice service or a visit to the ER are the current alternatives to the pediatric clinic at RACH. Since it is equally difficult to get
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<th>Combined Decimal</th>
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<td>0</td>
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an outpatient appointment with the family practice service as it is with the pediatric service, a visit to the ER is the most likely alternative for pediatric care. Convenience plays some part in the decision; however, more important is the parent's desire to see that the child receives care so that the condition doesn't become worse. Kahn, et al. found that 63% of the ER visits were due to the escort not wanting the condition to become worse and only 18% believed their child's condition was an emergency. The physician caring for a child in this setting usually does not know the child or his family and is placed at a disadvantage in understanding the long-term implications, both medical and psychosocial, of this or any other acute or chronic illness. By working under time constraints and with incomplete database, the physician is usually limited to the practical concerns of diagnosing and treating the particular episode that brought the child to the emergency room. It appears that when alternatives are considered to the current RACH system, emphasis should be placed on providing pediatric care in a location other than the ER whenever possible.

The results of the RACH study indicate that parent education may be a means of reducing pediatric ER utilization. Kahn, et al. and Weitzman, et al. found that escorts have difficulty identifying the degree of severity of a child's illness and that older children are more often brought in for appropriate reasons. The RACH finding that 56% of the children utilizing the ER were less than four years of age and that 42% of the complaints were elevated temperature and cold symptoms support their findings. This information, combined with the observation that 56% of the escorts were in the pay grade of E-6 and above, indicating an established tie to the military medical system, supports the concept that parent education could reduce pediatric ER utilization. The RACH pediatric service currently produces a pediatric handbook for
the non-pediatrician who cares for children in both the ER and the family practice clinic. This concept should be taken a step further to include a parent's pediatric handbook which provides information and advice. It could explain treatments for minor illnesses and give guidance about symptoms which indicate the child should be seen by a physician. By knowing what to do based on the guidance provided, more parents should be able to at least control the child's symptoms until a same-day appointment can be made and not resort to a visit to the ER.

The same-day appointment (SDA) was found to be a very important element in the provision of pediatric services at RACH. It also impacts upon ER utilization by pediatric patients. It was stated by 77% of all the escorts that they would have utilized a pediatric SDA instead of a visit to the ER, if they had known about the SDA system or they could have arranged for a SDA. Two important conclusions evolve from this fact. The first is that the SDA system needs to be better publicized. Of the 30% indicating they did not know about the pediatric SDA system, 87% stated they would have utilized the SDA option instead of an ER visit if they had known about the SDA. This could reduce the ER pediatric workload by an estimated 26%. This brings the second conclusion which is also required to compliment the first. The SDA system must be made more accessible and an increased number of appointments made available. Of the 70% aware of the SDA system, 77% stated they would have utilized the SDA option instead of an ER visit if they could have gotten a SDA. This could reduce the ER pediatric workload by an estimated 54%. The combination of more publicity and availability of SDA's has the potential of reducing the ER pediatric workload by 70%. Availability includes an increased number of SDA slots and accessibility. Accessibility is currently through the central appointment system (CAS). The
congestion of the CAS causes many escorts to become frustrated and eventually resort to an ER visit for the child's condition. Bookings for a pediatric SDA should be made directly with the pediatric clinic. This would be an appropriate time to have/implement telephonic screening of SDA requests, thus better insuring the appropriateness of a SDA request. When appropriate, advice could be given telephonically, eliminating the need for a SDA and could be logged as a telephone consult for workload data. By increasing availability and improving accessibility, the aforementioned reduction of 70% pediatric ER workload would reduce the entire ER workload by 25%.

When the escorts were asked about the pediatric clinic hours, 72% indicated a desire for different hours. However, 90% of the escorts' desires could be met by keeping the pediatric clinic open an additional hour, 0730-1730 hours. This additional hour could be used to provide more SDA slots and provide an opportunity for families with working parents to bring their children to the pediatric clinic instead of the ER. Currently, 11% of the pediatric escorts surveyed in the ER indicated that both parents worked. Transportation was also a problem indicated by the survey. Keeping the pediatric clinic open an hour later would provide those families with only one automobile an opportunity to use the pediatric clinic instead of the ER. Transportation is an area that the Post needs to assess to determine if there is an actual transportation problem or just an awareness problem.

The primary problem associated with pediatric care in the ER, as far as the escorts are concerned, is the waiting time. The results of the questionnaires indicated that 45% of the pediatric patients were seen in less than two hours, 69% in less than three hours, 79% in less than 3.5 hours, and 85% in less than four hours. The analysis of escorts' perceptions of ER waiting time
indicated that 67% of the escorts felt the waiting time was less than reasonable. To improve the escorts' perception of the ER, waiting time should be kept to two hours or less. By initiating the recommended changes mentioned previously, some of the pediatric ER workload will be reduced, thus causing some reduction in waiting time. During the survey of the ER, it was found that the previously utilized triage section and prioritization of patients had been eliminated. Patients are basically being seen depending on when they report to the ER with the exception of "bona fide" emergencies. This practice needs to be changed. Immediate triage upon reporting to the ER needs to be initiated. Weitzman, et al. found that 28% of the parents in their study underestimated the severity of their child's illness. A prioritization plan needs to be reestablished which insures that children and sick infants are seen before adults with non-emergency medical problems.

ALTERNATIVES

There are four alternatives which can be utilized to respond to the problem of pediatric ER utilization for non-emergency conditions. The alternatives are (see Table 5):

1. Change the pediatric service so that it can accommodate all pediatric care with the exception of emergencies.

2. Change the emergency service so that it can accommodate all the patient load it is currently experiencing and improve patient perceptions.

3. Moderately change both the pediatric service and emergency service.

4. Change nothing, keep the current system for providing pediatric care.

The advantages of alternative one, changing the pediatric service so that it can accommodate all pediatric care with the exception of emergencies,
<table>
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<th>Alternative 2</th>
<th>Alternative 3</th>
<th>Alternative 4</th>
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<td>Not always</td>
</tr>
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<td>Outpatient pediatric consultation at all times</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Decrease waiting time to three hours or less</td>
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<td>Yes</td>
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<td>No</td>
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<tr>
<td>Utilize current staff levels</td>
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<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Utilize current resources</td>
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<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
would be that the new system could be developed, staffed, and operated so that there would be no need for non-emergency pediatric patients to utilize the ER. To insure service, a section of the pediatric service would have to be staffed with a physician on a twenty-four hour basis. This would provide both convenient hours for the patients and same-day service. The disadvantages associated with the alternative are, there would still be a possibility that waiting times could be in excess of three hours, depending on the types of conditions seen and the distribution of patient arrivals.

To provide the twenty-four hour operation required by this alternative, staffing levels would have to be increased. The primary problem would be the additional requirements for physicians to cover the evening and night shifts. Additionally, monies would have to be provided for additional staff or other areas of the hospital would have to give up their staff. There is a possibility that the evening and particularly the night staff would not be utilized efficiently.

Alternative two, change the emergency service so that it can accommodate all the patient load it is currently experiencing and improve patients' perceptions, would provide convenient hours for the users in that the ER is operational on a twenty-four-hour-a-day basis. Same-day services would be provided and there would be outpatient pediatric consultation available at all times. This would be the only alternative which would positively reduce ER waiting time to less than three hours. This could be insured through proper staffing, equipping, and contingencies for back-up support so that waiting times would not exceed certain parameters. The alternative would not reduce the numbers of patients utilizing the ER as their treatment source. It may in fact, due to the reduced waiting times, increase the utilization of the ER.
Staffing levels for the ER would have to be at least doubled during the evening shift and possibly into the night shift. More space would be required to accommodate the additional staff and money would be needed to hire them. Staff could be taken from other areas in the hospital; however, this would only increase the backlog of appointments in the respective area.

The advantages of alternative three, moderately changing both the pediatric service and emergency service, are it could reduce the numbers being seen in the ER. This would be done through increasing availability and improving accessibility of the pediatric same-day appointment system. This could reduce the entire ER workload as much as 25%. Convenient hours for the patients would be provided. The ER would be operational twenty-four hours a day and the pediatric clinic's hours would be extended to accommodate working parents, families with only one automobile, and more SDA bookings. Same-day service would be enhanced in the pediatric clinic because of its extended hours of operation and the ER would be available as a back-up option. On-call pediatric consultation would be available at all times.

With the reduction of pediatric ER utilization and triage/prioritization of patients entering the ER, children and infants being seen before adults with non-emergency conditions, there is a possibility that ER waiting time could be kept below three hours for pediatric patients. This system would operate utilizing the staff and resources currently available.

The fourth alternative, leaving the system the way it is, does nothing to solve the current problems. The ER would still be mis-utilized, escorts would feel frustrated due to the long ER waiting times, there would not be adequate numbers of same-day appointments and they would have to be made through a CAS which is inadequate.
FOOTNOTES


4. Kahn, p. 156.

5. Kahn, p. 156.


8. Weitzman, p. 969.

9. Interview with Frank B. Parks, Captain, Medical Corps, OIC, Emergency Room, RACH (March 1983).

10. Weitzman, p. 969.
III. CONCLUSIONS

The research problem was to determine reasons why children less than the age of twelve utilize ER services when they do. This was done to determine the optimum method of providing the desired care within current resources for the children.

The reasons identified during the research for children utilizing the ER when they do are:

1. Convenience, this is however balanced against the known long wait.

2. The inability to bring the child's condition to medical attention as soon as possible due to both parents working.

3. The inability to bring the child's condition to medical attention as soon as possible because of transportation difficulty.

4. The escorts were not aware of the more convenient alternative, same-day appointments.

5. The alternative, SDA, was not accessible due to all appointments being scheduled or problems due to the central appointment system.

6. The inability of escorts to assess the severity of the child's illness.

7. The child's condition was an emergency.

The optimum solution is to moderately change the pediatric service and the emergency service. The pediatric service would be changed by extending its operation until 1730 hours instead of 1630 hours. This would
provide more SDA's and allow working parents and those with transportation problems to use the pediatric clinic. SDA's would be made by calling the pediatric clinic, doing away with the problem caused by the CAS and providing the opportunity for pediatric personnel to screen/telephone triage requests for SDA's. The pediatric service will produce a pediatric booklet for parents providing guidance and minor treatments to enhance the parent's ability to assess the severity of their child's illness. The SDA system will be better publicized so that parents will know there is a more convenient option than visiting the ER. The ER, due to the above changes, will experience reduced utilization by pediatric patients. The ER will initiate immediate triage upon a patient's arrival and all patients will be prioritized. Infants and children will be prioritized to receive care before adults with non-emergency conditions. The reduced numbers of pediatric patients utilizing the ER and the prioritization system should dramatically reduce ER waiting times for pediatric patients.

Getting the information out to the parents is the key to the success of the changes. The hospital public affairs officer (PAO) should arrange for the information to be placed in the Post newspaper and run at predetermined intervals to acquaint new arrivals and remind others. The PAO should coordinate the development and printing of a patient information booklet to inform patients about services provided and general information about RACH. Information about the changes in the pediatric service and the ER should be included in all of the PAO's newcomer briefings.

The research showed that knowing about the SDA leads to high utilization of the SDA system. With more SDA slots available and enhanced awareness of the SDA system, utilization of the SDA option will increase and
utilization of the ER by pediatric patients will decrease. This should cause the escort’s perception of the pediatric services provided by RACH to increase and promote a more efficient operation in the ER and pediatric clinic.

It is recommended that Fort Sill evaluate current transportation availability since it was identified as a problem. The Post should also encourage sponsors to bring their family members for care as soon as possible and not utilize the ER for non-emergency conditions. Commanders should be advised to release personnel to transport their dependents to the hospital when required.
APPENDIX A

PATIENT QUESTIONNAIRE
This questionnaire is anonymous, please do not indicate your name.

A special study is being conducted in an effort to analyze the pediatric system utilized by your child.

1. Date/Time __________________________  2. Location  
   [ ] Emergency Room  [ ] Pediatric Clinic

3. What would be the most convenient hours of operation for you of the Pediatric Clinic? (in a 9-hour block, i.e. 0730-1630, 0830-1730, etc.)

4. Were you aware of the same-day appointment system for the Pediatric Clinic?
   [ ] Yes  [ ] No
   If Yes, have you ever used the same-day appointment system?
   [ ] Yes  [ ] No
   If Yes, how long did you have to wait to be seen?

   _______________________________________________________________________

   What is your opinion about the waiting time for the same-day appointment system?

   [ ] a. The waiting time was reasonable.
   [ ] b. My child had to wait a fairly long time before being seen.
   [ ] c. My child had to wait a very long time before being seen.

5. Are you now or have you ever used the Emergency Room to provide care for your child?
   [ ] Yes  [ ] No
   If Yes, what was the approximate waiting time at the ER? _______________
What is your opinion about the waiting time in the ER?

- [ ] a. The waiting time was reasonable.
- [ ] b. My child had to wait a fairly long time before being seen.
- [ ] c. My child had to wait a very long time before being seen.

Would you have used the same-day appointment instead of the visit to the ER, if you had known you could get an appointment the same day?

- [ ] Yes  [ ] No

If No, why?

6. Were you able to bring your child's problem(s) or condition(s) to medical attention as soon as possible?

- [ ] a. Yes
- [ ] b. No, because both parents work and the problem began after parents reported to work.
- [ ] c. No, because of some other reason (Please explain)

7. Did you have any transportation difficulties getting to the hospital?

- [ ] a. No
- [ ] b. Yes. please explain

8. Do you have any suggestions how the pediatric services for your child could be improved or made more convenient? (If necessary, use back of page.)
APPENDIX B

PEDIATRIC SERVICES

SELF-ASSESSMENT QUESTIONNAIRE
1. What are the hours of operation for your outpatient pediatric clinic?

______________________________________________________________

2. Do you have scheduled pediatric sick-call hours?

☐ Yes ☐ No

If yes, what are the hours?_____________________________________

3. Do you have pediatric service on a walk-in basis during normal hours of operation?

☐ Yes ☐ No

If No, why?_________________________________________________

4. Do you have a same-day appointment system for pediatric patients at your facility?

☐ Yes ☐ No

If No, why?_________________________________________________

If Yes, approximately how long is the wait?_____________________

5. Are TMCs utilized by pediatric patients at your post or base?

☐ Yes ☐ No

6. Does your service screen patients to determine if their needs can be met by a non-physician?

☐ Yes ☐ No

If Yes, what are the qualifications of screener?_________________

______________________________________________________________

Appendix B
7. Do you have a separate emergency pediatric service?

☐ Yes  ☐ No

If Yes, what are hours of operation? ________________________________

If No, do physicians in the ER have pediatric consultation available on-call at all times?

☐ Yes  ☐ No

8. What special services are provided by your facility in support of pediatric outpatients? (Use back of page, if necessary.) ________________________________

______________________________________________________________

9. What special services would you like to see your facility provide in support of pediatric outpatients? (Use back of page, if necessary.) ________________________________

______________________________________________________________

10. Does the Post or Base on which your facility is located provide any special services in support of the pediatric service (i.e. transportation, child care, etc.)?

☐ Yes  ☐ No

If Yes, what are the services provided? ________________________________

______________________________________________________________

______________________________________________________________
APPENDIX C

EMERGENCY ROOM

LOG EXTRACT
### APPENDIX C. ER LOG EXTRACT

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<td></td>
<td>12</td>
<td>1603</td>
<td>E8</td>
<td>Asthma</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>1615</td>
<td>E6</td>
<td>Nose bleed</td>
</tr>
<tr>
<td>&quot;</td>
<td>5/12</td>
<td>1715</td>
<td>E2</td>
<td>+T, vomit</td>
</tr>
<tr>
<td>&quot;</td>
<td>8</td>
<td>1717</td>
<td>E5</td>
<td>+T, cough</td>
</tr>
<tr>
<td>&quot;</td>
<td>8</td>
<td>1749</td>
<td>E9</td>
<td>Chest pains</td>
</tr>
<tr>
<td>&quot;</td>
<td>19/12</td>
<td>1820</td>
<td>O3</td>
<td>Cough</td>
</tr>
<tr>
<td>&quot;</td>
<td>1/12</td>
<td>1841</td>
<td>E1</td>
<td>Refuses to eat</td>
</tr>
<tr>
<td>&quot;</td>
<td>1</td>
<td>1841</td>
<td>E5</td>
<td>Vomit</td>
</tr>
<tr>
<td>&quot;</td>
<td>2 5/12</td>
<td>1906</td>
<td>E6</td>
<td>Runny nose</td>
</tr>
<tr>
<td>&quot;</td>
<td>1 2/12</td>
<td>1916</td>
<td>E6</td>
<td>Poss. ear inf.</td>
</tr>
<tr>
<td>&quot;</td>
<td>6/12</td>
<td>1928</td>
<td>E3</td>
<td>Cold</td>
</tr>
<tr>
<td>&quot;</td>
<td>2 6/12</td>
<td>2000</td>
<td>E5</td>
<td>+T</td>
</tr>
<tr>
<td>&quot;</td>
<td>5</td>
<td>2107</td>
<td>E5</td>
<td>Earache</td>
</tr>
<tr>
<td>&quot;</td>
<td>22/12</td>
<td>2135</td>
<td>W01</td>
<td>Swollen ear</td>
</tr>
<tr>
<td>&quot;</td>
<td>6</td>
<td>2230</td>
<td>E6</td>
<td>Cough, earache</td>
</tr>
<tr>
<td>&quot;</td>
<td>10</td>
<td>E7</td>
<td>+T</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX D

COMPARISON OF PEDIATRIC OUTPATIENT SERVICES PROVIDED BY 30 MILITARY MEDICAL FACILITIES
## APPENDIX D - COMPARISON OF PEDIATRIC OUTPATIENT SERVICES PROVIDED BY 30 MILITARY MEDICAL FACILITIES

<table>
<thead>
<tr>
<th>HOSPITAL LOCATION</th>
<th>HOURS</th>
<th>PEDIATRIC CLINIC Y/N</th>
<th>PEDIATRIC TELEPHONE Y/N</th>
<th>PEDIATRIC ISLA Y/N</th>
<th>APPOINTMENT HOURS</th>
<th>UTILIZATION OF PATIENTS Y/N</th>
<th>PEDIATRIC HOURS Y/N</th>
<th>SPECIAL SERVICES PROVIDED BY MEDICAL FACILITY (add from table)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ft. Belvoir, VA</td>
<td>0730-1630</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Up to 45 hrs.</td>
<td>X</td>
<td>PWF X</td>
<td>Special care in post by pediatrician.</td>
</tr>
<tr>
<td>Ft. Benning, GA</td>
<td>0730-1630</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>1 hr.</td>
<td>X</td>
<td>Physician</td>
<td>Special care in post by pediatrician.</td>
</tr>
<tr>
<td>Ft. Bragg, NC</td>
<td>0730-1600</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>NP X</td>
<td>1700-2200</td>
<td>Special care in post by pediatrician.</td>
</tr>
<tr>
<td>Ft. Campbell, KY</td>
<td>0730-1630 M-F</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Varies</td>
<td>X</td>
<td>Phone Triage by Nurse or Physician -8.5. Waiting in Screening Area</td>
<td>Special care in post by pediatrician.</td>
</tr>
<tr>
<td>Ft. Carson, CO</td>
<td>0730-1615</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Depends on results of telephone triage</td>
<td>X</td>
<td>Phone Triage by Nurse or Physician (0730-1600)</td>
<td>Special care in post by pediatrician.</td>
</tr>
<tr>
<td>Ft. Lewis, WA</td>
<td>0800-1600</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>1/2 hour</td>
<td>X</td>
<td>None X</td>
<td>Special care in post by pediatrician.</td>
</tr>
<tr>
<td>Ft. Dix, NC</td>
<td>0800-1630</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>No wait</td>
<td>X</td>
<td>None X</td>
<td>Special care in post by pediatrician.</td>
</tr>
<tr>
<td>Ft. Hood, TX</td>
<td>0730-2100</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Varies</td>
<td>X</td>
<td>None X</td>
<td>Special care in post by pediatrician.</td>
</tr>
<tr>
<td>Ft. Jackson, GA</td>
<td>0730-1615</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Not more than 2 hrs.</td>
<td>X</td>
<td>None X</td>
<td>Special care in post by pediatrician.</td>
</tr>
</tbody>
</table>

### Special Services
- **Monthly Cardiology Consult Visit**
- **Seven day a week (0800-2100) telephone triage by pediatrician.**
- **Hearing and vision test at schools.**
- **Monthly Neuro, Cardiology and Hematology Consult visits from Vanderbilt Unr. Hospital.**
- **Improved shuttle bus service (transportation).**
- **Patient Education Handouts.**
- **Patient education using Monthly Cardiology, Pulmonology, videolab.**
- **Computerized records.**
- **Telephone answering system for incoming calls.**
- **Well Baby Clinic.**
- **Child Neurology and Psychiatry.**
- **Subspecialties from BAMC visit each Tuesday.**
- **Child Care, Speech Evaluation every 2 weeks.**
- **Pediatric Psychiatry.**
- **School nurse physical exams.**
## APPENDIX D - COMPARISON OF PEDIATRIC OUTPATIENT SERVICES PROVIDED BY 30 MILITARY MEDICAL FACILITIES (Cont'd)

<table>
<thead>
<tr>
<th>HOSPITAL LOCATION</th>
<th>0700-1830</th>
<th>0800-1000</th>
<th>1200-1600</th>
<th>1300-1530</th>
<th>1630-1800</th>
<th>APPOINTMENTS</th>
<th>SPECIAL RESOURCES</th>
<th>MEDICAL FACILITY</th>
<th>NOTE IDENTIFIED BY CHIEF OF PEDIATRICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ft. Knox, KY</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X less than 1 hour</td>
<td>X Nurse trained by physician</td>
<td>X X</td>
<td>Burteas</td>
<td>Pediatric OT, PT, Psychology, Psychiatry, Respiratory Therapy, Auditory and Speech Therapy</td>
<td>ENT Service</td>
</tr>
<tr>
<td>Ft. Lee, VA</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X None</td>
<td>X X</td>
<td>Nursery</td>
<td>Transportation for acutely sick patients</td>
<td>Well Baby Clinic, Pediatric ALLERGY Evaluation, School Physical Examinations, Child Abuse Evaluation</td>
<td>Pediatric ENT</td>
</tr>
<tr>
<td>Ft. Leonard Wood, NC</td>
<td>X</td>
<td>X</td>
<td>X AN only</td>
<td>X Morning Only</td>
<td>X None</td>
<td>X X</td>
<td>Community Pre-School Screening, Mobile Medical Evaluation Team, four hours per week</td>
<td>Day Care for siblings, Adolescent Clinic, Developmental Clinic, Early Intervention Therapy Group Classes, Video recorder for educational tapes, improved access to medical care for unaccompanied adolescent minors</td>
<td></td>
</tr>
<tr>
<td>Ft. Ord, CA</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X 30-90 minutes</td>
<td>X RN</td>
<td>X X</td>
<td>Orthopedics, Ophthalmology, Child Psychologist</td>
<td>Neurology, Allergy, Reprology</td>
<td></td>
</tr>
<tr>
<td>Ft. Polk, LA</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X RN</td>
<td>X X</td>
<td>Orthopedics, Ophthalmology, Child Psychologist</td>
<td>Neurology, Allergy, Reprology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ft. Riley, KS</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X None</td>
<td>X X</td>
<td>Adolescent Clinic, Well Clinic, Allergy Clinic, Periodic Specialty Visits</td>
<td>Child Psychology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ft. Sill, OK</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X Phone Triage by RN</td>
<td>X X</td>
<td>Child Care (Limited)</td>
<td>More appointment slots, Allergy/Allergy, GL, urinary tract, increased respiratory therapy care, Separate adolescent clinic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ft. Stewart, GA</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X Phone Triage by RN</td>
<td>X X</td>
<td>Child Care (Limited)</td>
<td>Neurology, Adolescent Cardiology, More appointment slots, Allergy/Allergy, GL, urinary tract, increased respiratory therapy care, Separate adolescent clinic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>West Point, NY</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X 2-3 hours</td>
<td>X None</td>
<td>X X</td>
<td>Day Care 0700-1730, Shuttle Bus every 15 minutes</td>
<td>Attarion testing, Dermatology, Immunizations, OT, Speech, Learning or Neurological Evaluations, Adolescent Problems, Child Psychologist</td>
<td></td>
</tr>
</tbody>
</table>
## APPENDIX D - COMPARISON OF PEDIATRIC OUTPATIENT SERVICES PROVIDED BY 30 MILITARY MEDICAL FACILITIES (Cont'd)

<table>
<thead>
<tr>
<th>HOSPITAL LOCATION</th>
<th>PEDIATRIC CLINIC</th>
<th>PEDIATRIC APPT. AREA</th>
<th>PEDIATRIC HOSPITALIZATION</th>
<th>IN-HOSPITAL</th>
<th>SPECIALTIES</th>
<th>SPECIALTIES PROVIDED BY</th>
<th>MEDICAL FACILITY</th>
<th>ISSUES IDENTIFIED BY CHIEF OF PEDIATRICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frankfurt, NY 7th Gen.</td>
<td>0730-1630</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>1 hour</td>
<td>Outlying Area</td>
<td>None</td>
<td>X</td>
</tr>
<tr>
<td>Langley AFB, 0730-1800 W-F</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>None</td>
<td>1600-1800 W-F</td>
<td>1600-1800 S-S</td>
<td>(After hrs)</td>
<td>Child Care for siblings.</td>
</tr>
<tr>
<td>Ft. Gordon, GA 0730-1600</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Emergencies Only</td>
<td>15 minutes to several hours</td>
<td>None</td>
<td>X</td>
<td>Child Care for siblings.</td>
</tr>
<tr>
<td>San Antonio, TX 0600-1630</td>
<td>X</td>
<td>X</td>
<td>NA</td>
<td>None</td>
<td>X</td>
<td>Pediatr. in ER 0600-2000 M-F and 0800-2100 Sat-Sun. Adolescent services, Developmental Services, All routine sub-specialties.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ft. Lewis, WA 0900-2010</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>1 day</td>
<td>None</td>
<td>X</td>
<td>Child Care Transportation Assistance</td>
<td></td>
</tr>
<tr>
<td>Honolulu, HI 0500-1630</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>None</td>
<td>24-Hour service</td>
<td>Child Care Transportation Assistance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Washington, DC 0745-1630</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Discouraged</td>
<td>1 to 2 hours</td>
<td>Telephone by Nurse or MD</td>
<td>X</td>
<td>Child Care Transportation</td>
</tr>
<tr>
<td>Ft. Bliss, TX 0630-1600 W-F</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>20 minutes to couple of hours</td>
<td>X</td>
<td>Child Care Transportation</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Pediatric Clinic Functions as emergency service 0745-1630.

Well Baby Care.

Newborn Care.

Pediatric Clinic Functions as emergency service 0745-1630.

Hostile Base Child Care. Onboard for Infants (0-24 mo) Child Abuse Counseling.

More accessible child care for siblings.
<table>
<thead>
<tr>
<th>Location</th>
<th>Time</th>
<th>shifts</th>
<th>sick-call</th>
<th>lunch</th>
<th>hours</th>
<th>nurse</th>
<th>Specialties</th>
</tr>
</thead>
<tbody>
<tr>
<td>NVAD Delawara, MD</td>
<td>0800-2100</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>4</td>
<td>x</td>
<td>Child Care, Social Work Services, Child Advocacy</td>
</tr>
<tr>
<td>NVAD Great Lakes, IL</td>
<td>0730-1530</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>1-2</td>
<td>x</td>
<td>Orthopedics, ENT, Radiology, Allergy, PT, Ophthalmology, Cardiology, Neurology, Hematology, Cultery, Gastroenterology, Infectious Disease, Family Services</td>
</tr>
<tr>
<td>NVAD Camp Pendleton, CA</td>
<td>0600-1630</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>Adolescent medicine clinic, Development Disabled Children Resource Coordinator, Pediatric Nurse and Well Baby in Housing Area</td>
</tr>
<tr>
<td>US Air Force Academy</td>
<td>0830-1430</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>30 min</td>
<td>x</td>
<td>Well Baby Clinic, Adolescent Clinic, Neurology, Hematology, Cardiology Clinics</td>
</tr>
</tbody>
</table>
APPENDIX E

THE CHI-SQUARE TEST OF INDEPENDENCE
FOR WAITING TIME AND ESCORT'S PERCEPTION
APPENDIX F - THE CHI-SQUARE TEST OF INDEPENDENCE FOR WAITING TIME AND ESCORT'S PERCEPTION

<table>
<thead>
<tr>
<th>Hours Wait</th>
<th>Reasonable Expected Cell Freq. (ECF)</th>
<th>Escort's Perception</th>
<th>Very long</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>ECF</td>
<td>ECF</td>
<td></td>
</tr>
<tr>
<td>0-.49</td>
<td>32</td>
<td>1</td>
<td>0</td>
<td>33</td>
</tr>
<tr>
<td>.5-.99</td>
<td>27 (13.0504)</td>
<td>8</td>
<td>2</td>
<td>37</td>
</tr>
<tr>
<td>1-1.49</td>
<td>15 (9.1705)</td>
<td>9</td>
<td>2</td>
<td>26</td>
</tr>
<tr>
<td>1.5-1.99</td>
<td>7 (8.1124)</td>
<td>8</td>
<td>8 (9.4496)</td>
<td>23</td>
</tr>
<tr>
<td>2-2.45</td>
<td>7 (13.4031)</td>
<td>18</td>
<td>13 (15.6124)</td>
<td>38</td>
</tr>
<tr>
<td>2.5-2.99</td>
<td>1 (8.4651)</td>
<td>8</td>
<td>15 (9.8605)</td>
<td>24</td>
</tr>
<tr>
<td>3-3.45</td>
<td>1 (8.8178)</td>
<td>6</td>
<td>18 (10.2714)</td>
<td>25</td>
</tr>
<tr>
<td>3.5-3.99</td>
<td>0 (4.9380)</td>
<td>1</td>
<td>13 (5.7519)</td>
<td>14</td>
</tr>
<tr>
<td>4-4.49</td>
<td>1 (7.4070)</td>
<td>0</td>
<td>20 (8.6279)</td>
<td>21</td>
</tr>
<tr>
<td>4.5</td>
<td>0 (5.9961)</td>
<td>2</td>
<td>15 (6.9845)</td>
<td>17</td>
</tr>
<tr>
<td>Total</td>
<td>91</td>
<td>61</td>
<td>106</td>
<td>258</td>
</tr>
</tbody>
</table>

$H_0$ = Waiting time and escort's attitude are independent

$H_1$ = The two variables are not independent
APPENDIX E (Cont'd)

Computation of $X^2$:

\[
X^2 = \left(\frac{32 - 11.6395}{11.6395}\right)^2 + \left(\frac{27 - 13.0504}{13.0504}\right)^2 + \left(\frac{15 - 9.1705}{9.1705}\right)^2 + \left(\frac{7 - 8.1124}{8.1124}\right)^2 + \left(\frac{1 - 13.4031}{13.4031}\right)^2 + \\
\left(\frac{1 - 8.4651}{8.4651}\right)^2 + \left(\frac{1 - 8.8178}{8.8178}\right)^2 + \left(\frac{0 - 4.9380}{4.9380}\right)^2 + \left(\frac{1 - 7.4070}{7.4070}\right)^2 + \left(\frac{0 - 5.9961}{5.9961}\right)^2 + \\
\left(\frac{1 - 7.8203}{7.8203}\right)^2 + \left(\frac{8 - 8.7481}{8.7481}\right)^2 + \left(\frac{9 - 6.1473}{6.1473}\right)^2 + \left(\frac{8 - 5.4380}{5.4380}\right)^2 + \left(\frac{18 - 8.9845}{8.9845}\right)^2 + \\
\left(\frac{8 - 5.6744}{5.6744}\right)^2 + \left(\frac{6 - 5.9109}{5.9109}\right)^2 + \left(\frac{1 - 3.3101}{3.3101}\right)^2 + \left(\frac{0 - 4.9651}{4.9651}\right)^2 + \left(\frac{2 - 4.0194}{4.0194}\right)^2 + \\
\left(\frac{0 - 13.5581}{13.5581}\right)^2 + \left(\frac{2 - 15.2016}{15.2016}\right)^2 + \left(\frac{2 - 10.6822}{10.6822}\right)^2 + \left(\frac{8 - 9.4496}{9.4496}\right)^2 + \left(\frac{13 - 15.6124}{15.6124}\right)^2 + \\
\left(\frac{15 - 9.8605}{9.8605}\right)^2 + \left(\frac{18 - 10.2714}{10.2714}\right)^2 + \left(\frac{13 - 5.7519}{5.7519}\right)^2 + \left(\frac{20 - 8.6279}{8.6279}\right)^2 + \left(\frac{15 - 6.9845}{6.9845}\right)^2.
\]

\[
X^2 = 35.62 + 14.91 + 3.71 + 0.15 + 3.06 + 6.58 + 6.93 + 4.94 + 5.54 + 6.00 + 5.93 + 0.06 + 1.32 + 1.21 + 9.05 + 0.95 + 0.00 + 1.61 + 4.97 + 1.01 + 13.56 + 11.46 + 7.06 + 0.22 + 0.44 + 2.68 + 5.82 + 9.13 + 14.99 + 9.20
\]

\[
X^2 = 188.11
\]

\[
df = 13
\]

\[
X^2_{13,0.995} = 29.819
\]

Since 188.11 is greater than $X^2_{13,0.995} = 29.819$, we reject the $H_0$ at the 0.005 level of significance. We conclude that waiting time and escort's attitude are not independent. With a $P$ value < .005.
APPENDIX F

HISTOGRAMS OF ESCORTS' PERCEPTIONS VS ER WAITING TIMES
APPENDIX F - NUMBER OF ESCORTS PERCEIVING ER WAITING TIME AS FAIRLY LONG VS ER WAITING TIME

Patients

Hours

0.49 1.49 1.99 2.49 2.99 3.49 3.99 4.49 4.99

1

8

9

8

18

8

6

1

2
APPENDIX F - NUMBER OF ESCORTS PERCEIVING ER WAITING TIME AS VERY LONG VS ER WAITING TIME
APPENDIX F - COMPARISON OF ESCORTS' PERCEPTIONS VS ER WAITING TIME

[Graph showing the comparison of escorts' perceptions vs ER waiting time. The graph plots patients against hours, with various curves representing different waiting time intervals.]
APPENDIX G

ER UTILIZATION BY CHILDREN

12 YEARS AND LESS
## APPENDIX G - ER UTILIZATION BY CHILDREN 12 YEARS AND LESS

<table>
<thead>
<tr>
<th>Feb</th>
<th>Total</th>
<th>0001-0730</th>
<th>0731-1630</th>
<th>1631-2400</th>
</tr>
</thead>
<tbody>
<tr>
<td>1, Tues</td>
<td>35/117</td>
<td>3/11</td>
<td>10/40</td>
<td>22/66</td>
</tr>
<tr>
<td>2, Wed</td>
<td>49/131</td>
<td>4/12</td>
<td>19/54</td>
<td>26/65</td>
</tr>
<tr>
<td>3, Thur</td>
<td>48/133</td>
<td>8/13</td>
<td>15/57</td>
<td>25/63</td>
</tr>
<tr>
<td>4, Fri</td>
<td>44/117</td>
<td>6/12</td>
<td>24/72</td>
<td>14/33</td>
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APPENDIX G (Cont'd)

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% of Total Workload
1541/4281 = .3599626
.36

36% of the ER's workload is for children aged 12 and below

49% of ER visits by children 12 years and less are between the hours of 1631-2400 and 58% between 1631-0730

Information from ER logs for February 1983
SELECTED BIBLIOGRAPHY

Journals


Kleiman, Michael B. "Who Uses the Hospital Emergency Room: Correcting a Misconception." Hospital and Health Care Services Administration 1 (1981): 63-71.


