

# Issue Analysis Example

## Helicopter Emergency Medical Services in the United States

### *Background*

Civilian helicopters dedicated exclusively to patient care and transport were first introduced in the US in 1972. The impetus for the development of civilian helicopter ambulances was based on the concept of the “Golden Hour” and experience in the Korean and Vietnam wars. There has been a significant proliferation of medical helicopters and medical helicopter operations in the US over the last decade. Concern for over utilization of these services is highly warranted and some experts warn that the proliferation of helicopters cannot be justified based on the medical literature. Since these services regularly cross state lines to transport patients, federal intervention is appropriate.

Dr. R. Adams Cowley of the famous Shock-Trauma Unit in Baltimore, MD discovered that when seriously injured patients were able to gain access to the operating room within 1 hour of the time of injury, the highest survival rate was achieved (85%); however, there is no scientific article that supports or refutes this concept of the “Golden Hour”. It seems that the prestige of Dr. Cowley and his colleagues resulted in widespread acceptance and adoption of the concept. Despite the lack of definitive scientific evidence, numerous research studies and requests for funding are based on achieving the golden hour for all trauma patients: many federal and state grants have been awarded to determine when and what interval(s) of time are critical.

### *Outcomes*

A meta-analysis of 22 studies comprising 37,350 patients transported from the scene of their injury to a trauma center concludes that 69% had non-life threatening injuries and 26% were discharged within 24 hours after arrival at the trauma center. In seven studies ranging from 1987 – 2002,

Basing transport criteria on mechanism of injury (MOI), while widely accepted by national associations, emphasizes situational conditions rather than patient physiological conditions. MOI criteria have been found to correlate poorly with injury severity. If a patient can walk to the helicopter, he is not a candidate for air transport.

Anecdotal stories tell of small, refurbished helicopters with no air conditioning flying patients with myocardial infarctions. Some of the for-profit helicopters have passenger compartments that allow EMTs or other personnel access only to the patient’s torso (because the legs are located in the tail of the helicopter).

### *Safety*

There was a steady and marked increase in the number of medical helicopter accidents in the US during the 10-year period (1993-2002). The authors concluded that “these findings are worrisome in light of recent research that has indicated use of medical helicopters may be excessive and nonbeneficial for most patients.” Fifty-two percent of all reported accidents occurred during the last 3 years of this period. Several studies (at least 8) have documented that a significant number of trauma patients transported from the scene to a hospital by helicopter do not receive any added benefit from helicopter transport. Pilot surveys show there is pressure for speed responses or lift-off times, continuing to fly in marginal weather, night flights, and flying when fatigued or ill. Cockpits are not standardized in medical transport helicopters.

Although FAA regulation applies, there is no medical regulation of helicopter transport services. A voluntary certification program is available at the Commission on Accreditation of Medical Transport Services (CAMTS). For example, Vanderbilt's LifeFlight is certified by CAMTS but UT's LifeStar service is not. UT's helicopter team cites the cost (~\$20,000) and lack of ROI as barriers to certification. For-profit HEMS services are not required to demonstrate medical preparation to any regulatory agency in Tennessee. These services build their market share by promoting their services to "subscribers" and often set up a table outside a Wal-Mart or other public place to solicit subscriptions. Similar to subscription services to some county-run EMS services, the consumer pays ~\$60 per year for a "membership." The membership allows the member and his family to use EMS services without paying a co-pay or any other fees. The subscription company bills the member's insurance for the service.

Accidents are directly related to financial pressures on transport services. One crash in Miami Florida occurred because the helicopter departure path required maximum performance at every takeoff. The flight path was between an office building and a parking garage. Management's comment prior to the accident, "I know it is really tight in there, but deal with it, because we need the work." Competition between geographically close HEMS leads to faulty decision making, cutting safety corners, eliminating safety infrastructure, cutting training and education and general apathy toward developing a safety culture.

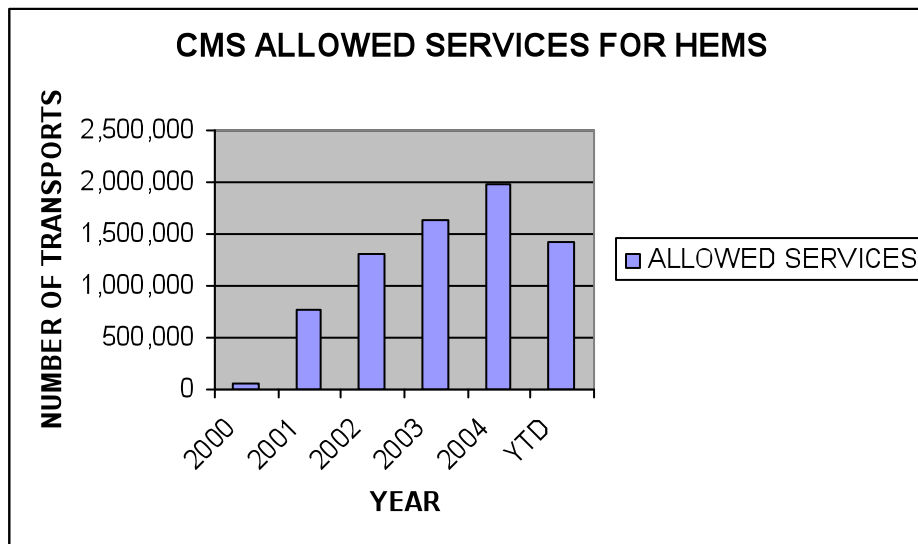
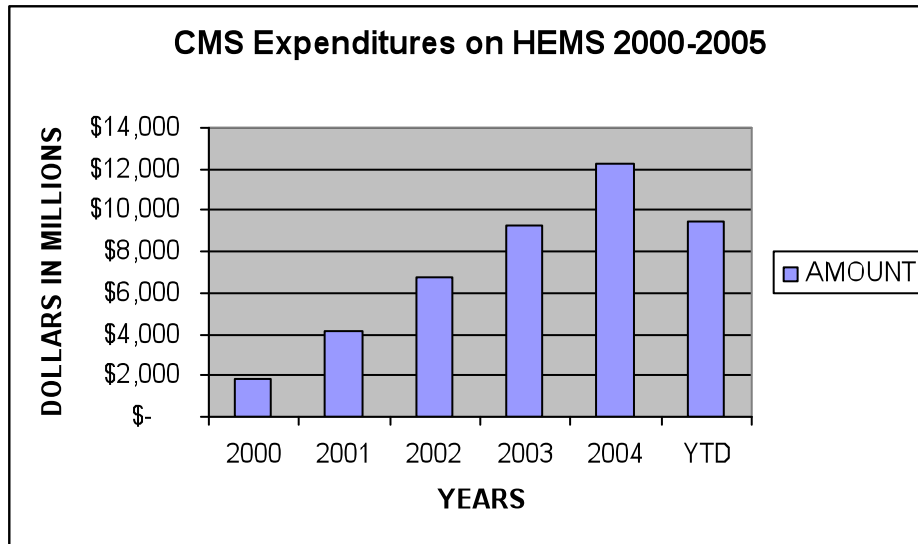
### *Cost Effectiveness*

Increasing reimbursement by Medicare and Medicaid

Each EMS helicopter cost between \$750,000 and \$4,700,000 depending on configuration and equipment. The average operating cost per year, per helicopter, is approximately \$1,000,000. Attempting to quantify the expense for helicopter transport is very difficult. CMS was able to provide data for independently owned helicopter suppliers only. Data for hospital based helicopter services are not available because these services are billed through Medicare Fiscal Intermediaries. CMS believes hospital-based helicopter services may account for a majority of air transport claims. Since CMS is unable to tease out which hospitals own helicopters, it is not possible to know the percent of transport provided by for-profit versus not-for-profit air services.

Given these caveats, calculable CMS expenditures for HEMS since 2000 has been \$437,631,493. Trends are noted in the chart below. Even with the limited data provided, the trends are evident. Fueling these trends is the rise of HEMS subscription service.

Subscription services for air helicopter services contribute to over utilization. Anecdotes from UT's LifeStar team relate the belief by subscribers that "the helicopter will land in their backyard whenever they call." UT LifeStar leaders admit that the proliferation of for-profit helicopter transport services is directly linked to over utilization as subscribers make their own decisions about mode of transport and non-profit helicopter services "compete" for market share. Subscription services are not regulated by most state insurance departments.



**Recommendations:**

These recommendations could be added to the trauma reauthorization legislation or in the Committee report on the bill.

1. Helicopter usage criteria should be based on physiological parameters in combination with mechanism of injury and should concentrate on rural responses rather than urban and interhospital transfers. Research is needed to further explore the predictive relationships for these types of transports.
2. Helicopter operations are probably best operated as part of an EMS operation or governmental entity instead of a hospital.
3. Utilization studies of EMS transport should always describe need as well as frequency of use. All HEMS services should be required to report these data.

4. Federally funded trauma databases should collect mode of transport information in tandem with validated and recognized patient trauma scores and physiological parameters (example Glasgow Coma Score plus pulse)
5. The Government Accountability Office or Institute of Medicine should study:
  - How wide-spread are so-called EMS subscription services and what is the relationship of these services to increasing utilization and over utilization of EMS services (ground and helicopter) with subsequent billing to Medicare and Medicaid?
  - Are state governments adequately regulating HEMS transport, especially between states?
  - What are the costs of public payments for inappropriate use of helicopter EMS services?
  - Do high-end HEMS (larger aircraft with exceptionally trained personnel usually associated with academic health centers) and low-end HEMS have disparate health outcomes for transported patients?
  - Other questions as appropriate
6. Medical oversight of all HEMS is necessary. Since HEMS crosses state lines, this may best be accomplished by a federally authorized organization.