

HELICOPTER FLIGHT CREW

PHYSICAL REQUIREMENTS

Air medical transport by helicopter results in a unique work environment. Aircraft requirements are paramount.

Maximum gross weight limits exist for each type of aircraft because overall aircraft performance capabilities may be limited by weight, depending on the aircraft's make or model. This performance limit further is exemplified when flying under instrument flight rules (IFR) because significant reserve fuel is required for these flights. If the weight of the medical equipment and crew is too much to permit the minimum required fuel, an IFR flight may have to be refused.

Limiting the weight of the crew also increases the safety margin of flight operations. In a twin-engine helicopter, if one engine fails, the remaining engine is likely to perform better with a lighter load. Decreasing the load also enables the aircraft to fly faster and conserve fuel. Flight crew performance also is limited because of space restrictions. Based on these premises, Geisinger Life Flight decided to maximize aircraft performance and safety margins by establishing a weight policy for all flight crew members. A personal fitness requirement also was sought to maintain the health and personal safety of the flight crew. The program believed it prudent to see what others in the industry were doing before establishing its policy.

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TABLE 1**Classification of helicopters based on gross helicopter weight in pounds**

Group 1	<4500	Bell 206 B, L
Group 2	4501-5000	AS 350, Alouette
Group 3	5001-6000	AS 355, BO 105, AUG 109
Group 4	6001-7500	BK 117
Group 5	7501-8500	Bell 222, 230
Group 6	>8500	UH1, Dauphin, Bell 214, 412, S-76

A survey preapproved by the Association of Air Medical Services (AAMS) was mailed to the medical director of all existing U.S. AAMS helicopter programs in 1995 to establish a database. If no response was received, a second mailing was sent to the medical crew supervisor of the program. One-hundred-fifty-seven of 228 programs (69%) responded. Eighty-seven of the responding programs had a weight restriction; 56 of these defined a maximum weight in pounds. For men this restriction ranged from 175 to 250 pounds, with a mode of 200 pounds and a mean of 202 pounds. For women the range was 145 to 250 pounds with a mode of 200 pounds and a mean of 199 pounds. An interesting note is that only four of 87 programs separated gender when determining maximum weight limits.

Thirty-six programs used a height-weight chart to determine maximum weight. Most of these used an insurance company or military height-weight chart. Five of the 36 programs also had an absolute weight maximum, although they primarily used a height-weight chart.

The type and gross weight of the helicopter and the weight restriction policy were examined to see if any trends were evident. The helicopters were first grouped by gross weight (Table 1). The mean weight restriction for the groups then was determined (Table 2). As seen in Table 2, no real trend seemed evident. Not surprisingly, however, the percentage of programs with a weight restriction requirement trended downward as the gross weight of the helicopter increased (Table 3).

The programs with weight restrictions used a variety of personnel to obtain and supervise their requirements. Some required the crew members to report their own weight; in some instances the pilot was responsible for recording weights. The medical crew supervisor was responsible in other programs, and some programs re-

lied on the employee health service. Weights were checked as often as daily and as infrequently as at-hire only. If a person was found to be overweight, actions taken by the programs varied. At one program a crew member could be suspended immediately and dismissed if no improvement was shown in 2 weeks. In another program, a crew member could begin weight reduction within 6 weeks and have a "reasonable period" in which to reach the weight loss goal ("reasonable" was determined by a wellness program or personal physician and chief flight nurse). Some programs offered weight-reduction counseling; others did not.

Thirty-seven programs had enforced their weight restriction by removing an overweight crew member from active status. These programs were resurveyed to see if they had ever dismissed (not merely suspended) anyone because of the weight restriction requirement. Twenty-seven programs responded to the addendum. Of these 27, 14 programs have dismissed 15 employees. Only one episode of litigation was reported. No employee was reinstated to a flight crew position after dismissal. Two programs changed their weight policy as a result of employee dismissal; these programs said they changed their policy because they were losing good flight crew members. Nine programs stated they considered the Americans with Disabilities Act when developing their policy. Special allowances were made by some programs for pregnant and lactating women.

Only 54 programs had instituted flight crew fitness requirements. Of the programs with such requirements, eight had removed members as a result of failure to meet these requirements. A wide range of requirements existed. Physical examinations may have included hearing tests, immunization titres, complete blood count, liver function tests, electrocardiogram, chest radiograph, visual acuity, pul-

TABLE 2**Weight restriction in pounds for flight crew personnel**

	Mean	Range
Group 1	198	(163-225)
Group 2	196	(175-220)
Group 3	202	(145-250)
Group 4	208	(190-240)
Group 5	201	(160-225)
Group 6	210	(175-250)

TABLE 3**Percentage of programs with weight restrictions classified by helicopter gross weight**

Group 1	64
Group 2	71
Group 3	73
Group 4	47
Group 5	41
Group 6	45

monary function tests, and urinalysis. Additional physical requirements could have included:

- Lifting (with an assistant) the stretcher with 150 pounds of additional weight
- Carrying 25 pounds over 100 feet
- Rotating trunk 30 times to each side
- Kneeling 5 minutes
- Crouching 1 minute
- Performing 20 deep squats
- Attending proper lifting technique in-services
- Withstanding VO₂ maximum testing
- Passing an agility test that involves loading stretcher and climbing steps
- Walking a mile in less than 17 minutes
- Climbing five flights of steps in less than 2 minutes
- Standing 30 minutes per hour
- Sitting 60 minutes per hour
- Wearing seatbelt in helicopter
- Performing CPR continuously for 5 minutes

The list continued, but these examples are representative. Tests for which details were not given included back, strength, and step tests. Usually the employee health service was responsible for testing fitness requirements. If a crew member was unable to meet physical fitness requirements, some programs had retesting provisions. The fit-

ness requirements were variably checked after hire. Usually only portions of initial testing were checked yearly.

The programs with fitness requirements who had removed a member from active status as a result of failing to meet the requirements were resurveyed. Of the six that responded to this addendum, only two programs had dismissed employees; one of these employees returned to the program. Only one program changed its fitness requirements because of employee dismissal. None had considered the Americans with Disabilities Act when determining their policy.

Life Flight's Weight Policy

After reviewing the above information, Geisinger Life Flight, which operates two BK 117s, developed the following policy, which took effect September 1, 1995.

Each crew member is restricted to a weight limit of 225 pounds in his or her Nomex flight suit and shoes. This restriction applies to men and women alike. Each flight crew member is to be weighed quarterly by the pilots responsible for the aircraft weight and balance determinations. Crew members exceeding the weight limit by 5 or fewer pounds will be asked to lose the excess within 30 days; those exceeding the weight limit by more than 5 pounds must agree to lose at least 5 pounds every 30 days until

the weight limitations are met.


Flight crew members exceeding the weight will be weighed monthly in the first week of each month, and those not making appropriate progress will be subject to suspension as determined by the Life Flight administrative committee. Crew members who consistently exceed the weight limit more than 6 months may be terminated from the program.

Because this is a new policy, any crew member exceeding 225 pounds will be offered appropriate dietary counseling, which will be arranged through health services. A weight-reduction program will be implemented as recommended by dietary guidelines, and crew members exceeding 225 pounds will be given ample and fair time to comply with the weight limit. Again, lack of progress toward the weight limit will be reviewed by the Life Flight administrative committee. A 3-month lack of progress will subject the crew member to suspension; a 6-month lack of progress will result in termination.

Two crew members exceeded the weight restrictions when the policy was implemented in 1995. They were referred to Geisinger's health and nutritional services department, which was responsible for counseling them and overseeing their weight loss. Because these crew members made progress and continued their weight

loss, the program did not taken disciplinary action. As of August 1997, the flight crew weight policy was still successful.

Conclusion

Although the database we developed was helpful in establishing a weight-restriction policy, it attests to the wide variation in the industry with regard to weight and fitness. If the industry as a whole believes that weight restrictions add a margin of safety and performance to air medical care and that fitness requirements help preserve and maintain the health of flight members, an industry-wide standard should be considered. 

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