

Projecting the General Cardiology Workforce Shortage

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Introduction

- There is growing evidence that the U.S. will face a physician shortage over the next 10 to 20 years.
- Since 1987, there has been a dramatic decline in the number of U.S. medical school graduates matching in internal medicine residencies; 26.5% in 1987 versus 19.0% in 2006.
- The 35th Bethesda Conference predicted an impending shortage of general cardiologists.

Objective

- This paper models the projected need for general Cardiologists from 2005-2050 using current training program durations compared to that of a “Fast-Track” program for Electrophysiology (EP) and Interventional Subspecialty Fellowships.

Methods

- **Number of EP and Interventional Spots per Year:** The 35th Bethesda Conference revealed that only 120 of 173 EP spots and 229 of 269 Interventional spots are filled per year. These baseline partial fill rates were used to assess the effect completely filling these subspecialty fellowship positions would have on overall number of General Cardiologists.
- **Initial Number of General Cardiovascular Trainees:** In 2001, there were 2160 total trainees and 709 first year fellows. In the baseline conditions of the model, the number of first year fellows was taken as 709, 2nd year fellows numbered 726, and 3rd year fellows numbered 725.
- **Total General Cardiologists:** There are an estimated 6 cardiologists per 100,000 U.S. residents. This was used as the basis for calculating the number of cardiologists in the US at 16800 in 2005.

Methods (cont'd)

- **Growth in Need for General Cardiologists:**
 1. **Effect of Retirement:** It is estimated that 10% of Cardiologists will retire within the next decade. Thus, **the model uses 1%/year increase in need due to retirement.**
 2. **Effect of Prevalence of Heart Disease (HD):** Heart disease deaths indicate a need for cardiologists however, prevalence of HD is more important than death in determining workforce requirements. **In this model, it was assumed the prevalence of HD will grow by 1.7%/year until 2030. As the baby boomer population passes away, the prevalence of HD will decrease by 0.58%/year from 2030-2040 and 0.39%/year from 2040-2050.**
 3. **Effect of Decreasing Physician-Patient Load:** The average physician’s patient load in cardiovascular medicine declined by over a third from 1980-1995. There are a higher proportion of patients who require the care of more than one cardiovascular specialist (e.g., a General Cardiologist, Electrophysiologist, Interventionalist, and/or Heart Failure Specialist). For every 10% decrease in average patient load, 20% more physicians are required. **The model uses 2%/year increase in demand due to decreasing physician-patient load.**
- **Effect of Cardiovascular Subspecialty “Fast-Tracking”:**
 1. The 8th Working Group of the 35th Bethesda Conference suggested a means to allow a 5-year short-track to train general cardiologists. The trainee would complete 2 years of general internal medicine then 3 years of cardiology. This short-track would increase the number of general cardiologists and free up more money for additional trainees. However, they did not discuss the possibility of “Fast-Tracking” for Interventional or Electrophysiology Fellowships for those who have already completed a 3 year Internal Medicine residency.
 2. In this model, **“Fast-tracking” would comprise 2 years of a General Cardiology Fellowship then 2 years of either Interventional or Electrophysiology training.** This concept of “Fast-Tracking” was incorporated into the model to assess its effect on the General Cardiology Workforce numbers.

Results

- **Growth in Need for General Cardiologists from 2005-2020:**
 1. Current training program durations and fellowship spots would result in 66.8% the projected need for General Cardiologists in 2020. (22365 versus 33459 General Cardiologists). See **Figure 1.**
 2. Fast-Tracking would increase the number of General Cardiologists by 1396 over the next 15 years.
 3. A 100% fill rate of EP and Interventional Fellowship positions, using today’s training duration, would lead to a 6.2% decrease in General Cardiologists (n=1395). Fast-Tracking would help to offset this decrease. See **Figure 2.**
- **Growth in Need for General Cardiologists from 2005-2050 :**
 1. Current training duration (blue line) and Fast-Track (red line) would still result in deficit when compared with model projection of need for General Cardiologists (green line) from 2005-2050. See **Figure 3.**
 2. At the peak demand in the year 2038, current training durations and Fast-Tracking would result in 46.5% (n=29043) and 52.1% (n=32533) the projected need for General Cardiologists.
 3. Doubling the number of General Fellows trained and incorporating Fast-Track for EP and Interventional fellows would help offset the predicted shortage in General Cardiologists (green line) by year 2020. However, this would result in an oversupply in General Cardiologists by the year 2050. See **Figure 4.**

Conclusion

- There is evidence of an impending shortage of General Cardiologists that will peak in 2038 reaching only 46.5% (n=33409 fewer cardiologist) of the projected need.
- This results from a complex cascade of declining US medical graduates and those matching in Internal Medicine residencies, combined with an increasingly complex cardiovascular disease patient requiring the care of multiple, distinct cardiovascular specialists.

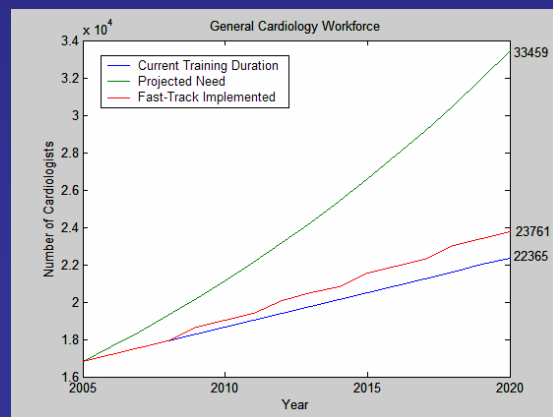


Figure 1. Projection of Number of General Cardiologists from 2005-2020. Current training durations would result in only 66.8% the projected need for General Cardiologists in 2020. Fast-Tracking would add 1396 General Cardiologists by 2020. (Projection includes 1% Annual Growth for Retirement, 1.7% Annual Growth for Increasing Prevalence Heart Disease, and 2% Annual Growth to Account for Decreasing Physician/Patient Load)

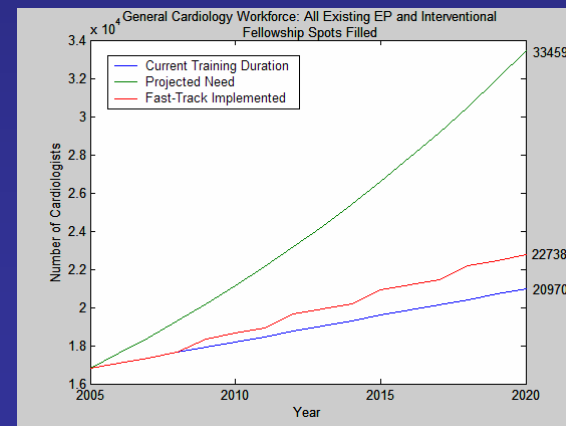


Figure 2. Effect of Filling 100% of EP and Interventional Fellowship Spots Starting in 2006. Currently, only 120/173 (69%) of EP Fellowship positions and 229/269 (85%) of Interventional Fellowship positions are filled. A 100% fill rate, using today’s training duration, would lead to a 6.2% decrease in General Cardiologists (n=1395) compared to current fellowship fill rates. Fast-Tracking would help to offset this decrease.

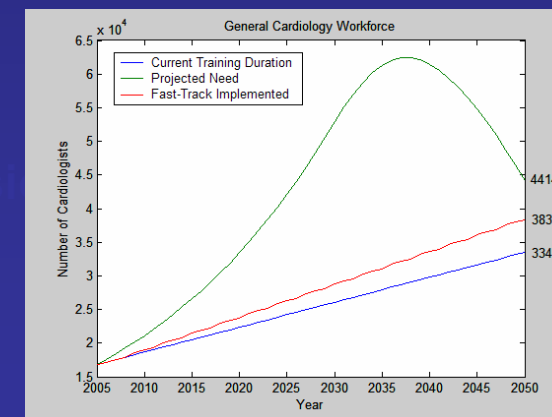


Figure 3. Projections of Cardiology Workforce from 2005-2050. This model incorporates a decrease in heart disease prevalence by 0.58%/year from 2030-2040 and 0.39%/year from 2040-2050. Current training duration (blue line) and Fast-Track (red line) would still result in deficit when compared with model projection of need for General Cardiologists (green line). At the peak demand in the year 2038, there is a projected need for 62,452 General Cardiologists. Current training durations would result in 46.5% (n=29043 total cardiologists) the projected need and Fast-Tracking would result in 52.1% the projected need for General Cardiologists (n=32533).

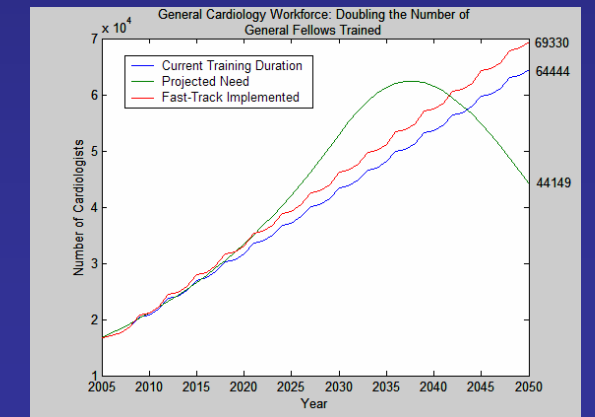


Figure 4. Projections of Cardiology Workforce from 2005-2050. The blue line indicates total number of General Cardiologists output if number of total fellows increased to from 2160 to 4320 over 3 years. The red line indicates number of General Cardiologists output if Fast-Tracking implemented at the same time the total number of fellows was doubled. Doubling the number of General Fellows trained and incorporating Fast-Track for EP and Interventional fellows would help offset the predicted shortage in General Cardiologists (green line) by year 2020. This would result in an oversupply in General Cardiologists by the year 2050.