Has the Volume and Variability of Procedures Reported by Fellows in ACGME-Accredited Musculoskeletal Oncology Fellowship Programs Changed Over Time?

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Introduction
National societies have been concerned that the increasing number of orthopaedic oncologists, coupled with a limited number of patients with bone and soft tissue sarcomas in the country, may have led to an unintended impact on the training spectrum and/or exposure of orthopaedic oncology fellows-in-training over time.

Questions
• Has the median surgical procedure volume per fellow changed over time?
• How much variability in procedural volume exists between fellows, based on the most recent (2017) Accreditation Council on Graduate Medical Education (ACGME) procedure log data?
• What proportion of fellows are meeting the minimum procedure volume thresholds, as recommended by the Musculoskeletal Tumor Society (MSTS)?

Materials and Methods
• 2010 to 2017 ACGME Fellowship Case Logs
• The 2010 to 2016 anatomic site-based procedure log data were used to evaluate fellows’ overall and location-specific median operative volume.
• The 2017 categorized procedure log data were used to assess variability in procedure volume between the lowest (10th percentile) and highest (90th percentile) of all fellows.
• We compared the MSTS minimum procedure volume standards against the number of procedures performed by fellows across the 10th, 30th, 50th (median), 70th, and 90th percentiles in 2017 alone.

Results
• There was no change in the median procedural volume per fellow from 2010 (292 procedures [range 131 to 634]) to 2017 (312 procedures [range 174 to 479]; p = 0.58).
• There was considerable variability in procedural volume between the lowest (10th) centile and highest (90th) centile of fellows across programs: pediatric oncologic procedures (10-fold difference), surgical management of complications from limb-salvage surgery (sevenfold difference), soft-tissue resections or reconstructions (fourfold difference), bone sarcoma resections or limb-salvage surgery (fourfold difference), and spine, sacrum, and pelvis procedures (threefold difference).
• For the spine and pelvis (minimum = 10 procedures), fellows in the lowest 10th centile performed only six procedures.
• For patients with bone sarcomas or limb salvage (minimum = 20 procedures), fellows in the lowest 10th centile performed only 14 procedures.
• For pediatric patients with oncologic conditions (minimum = 15 procedures), fellows in the 50th centile (13 procedures) and below failed to meet the thresholds.

Conclusions
• Despite an increasing number of fellowships, the median number of procedures performed by musculoskeletal oncology fellows has not changed over time.
• However, a variability in the types of procedures performed by ACGME-accredited oncology fellows exists, with a number of fellows reporting procedure numbers that do not meet the recommended minimum threshold before completing their training.