**Supplemental Material:**

***Phase 1***

In 2013, we undertook the development of an MSF instrument to measure all intrinsic CanMEDS roles in internal medicine residents as a generalist specialty to determine those relevant to a leadership construct. After a literature review of all MSF tools, as well as the RCPSC training objectives for Internal Medicine residents and intrinsic CanMEDS roles, up to 10 items were generated and assigned to different assessor groups to cover a full range of assessor group participants and key competencies across all intrinsic roles.

***Phase 2***

Focus groups were then held to determine the face and content validity on a set of items. Focus groups were held with residents, nurses and allied health care staff to review the items because they had content expertise in working with residents. An attending physician and medical clerk also reviewed the items. Four separate MSF questionnaires were developed for each group. Each of the MSF questionnaires were made available online to assist with pilot data collection from residents, peers, medical clerks and nurses. In order to expedite the process and reduce the burden on our patient group, we excluded patients during the pilot phase. Participants were e-mailed the link to the questionnaire along with a picture of the resident they were to assess. Most responses came from nurses (n=20 questionnaires) who were asked to assess residents on two intrinsic CanMEDs roles which nurses felt met the criteria for leadership.

The internal consistency for the questionnaire using nurse responses was measured to be 0.92 (0.87 and 0.85, respectively, for the *Collaborator* and *Manager* subscales). While MSF could provide reliable feedback to junior residents regarding their performance on intrinsic CanMEDs roles relevant to leadership, we found that not all roles could be measured by

assessors during an encounter with a resident. Encounters between residents and participant groups also vary significantly and participants may be unable to assess all residents across the roles. This led to low response rates (less than 10%). As such, the idea of using MSF to measure the intrinsic CanMEDS roles to represent the multi-faceted construct of a leader, while beneficial for residents, may require further evidence on its utility and feasibility through further investigation. Also, with the move towards milestones and competency based medical education, measuring intrinsic CanMEDS roles was thought to no longer be relevant; whereas a global assessment of key competencies that assessed the *Leader* role which incorporated QI/PS was deemed warranted. This phase consisted of a consensus meeting to review phase 2 results with a medical education researcher, and the program directors from three residency training programs (internal medicine, general surgery and pediatrics).



Bharwani A, *et al. BMJ Leader* 2020;0:1–9. doi: 10.1136/leader-2020-000286