

Rehabilitation Emergencies: A Simulation Lab for PM&R Residents

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Background

Simulation-based learning has been well-established across Graduate Medical Education programs throughout the country and has been shown to enhance resident learning, self-confidence and improve patient-related outcomes. Simulations can improve residents' communication skills, team training and response to dangerous clinical scenarios. These benefits have been demonstrated through publications involving numerous medical specialties; however, the field of physical medicine and rehabilitation (PM&R) is lacking in similar studies. PM&R residents at Louisiana State University often encounter urgent medical conditions throughout their training, whether on the inpatient rehabilitation floors or in the outpatient procedure suite. Given the documented success of simulation labs across other specialties, it was determined that PM&R residents at LSU would benefit from a simulation case curriculum of commonly encountered rehabilitation emergencies. Case examples include: autonomic dysreflexia, pulmonary embolus, vasovagal syncope during a procedure, seizures, agitation, and post dural puncture headache.

Objectives

- To design a biennial simulation lab for PM&R residents at LSU (six cases in total; three cases each year).
- Residents will have exposure to each case simulation two times throughout their four-year residency program to enhance their confidence in managing these scenarios.
- Goal: to achieve a statistically significant improvement in self-confidence in handling these scenarios after the simulation lab.

Methods

- Residents were divided into three groups with an even distribution of upper level and lower level residents.
- Each group ran through designed simulations separately. A faculty member was present in the simulation room to provide guidance and feedback in real-time.
- While one group performed the simulation, the other groups spent time working through an ASIA exam scoring worksheet.
- Debriefing: after each case, residents and faculty spent time discussing proper management. Handouts with current guidelines were provided to residents.

Change Recommendations

- This simulation curriculum will be worked into LSU PM&R didactics on a yearly basis with rotation of cases biennially.
- As the field of PM&R continues to evolve, cases can be revised and/or new cases added (long COVID management, etc).

Conclusions

This initial simulation experience suggests the importance of incorporating hands-on, case-based learning into PM&R resident didactics to improve resident competence and confidence and subsequently improve patient outcomes.

Results

- Pre- and Post- Simulation Quizzes were administered to assess comfort and knowledge-base for rehabilitation emergencies.
- Surveys incorporated questions with a 5-point Likert Scale (ranging from not confident at all to very confident) to assess resident comfort as well as discussion questions to assess resident knowledge.

- When comparing pre- and post-simulation data, there was a statistically significant improvement in resident confidence level of handling rehab emergencies and running a code ($p < 0.0001$), as well as a statistically significant improvement in resident confidence level of performing an ASIA exam and arriving at a correct SCI diagnosis ($p < 0.0039$).
- There was also a statistically significant improvement in resident knowledge, with residents averaging 65.79% pre-simulation compared to 100% post-simulation, as measured by two discussion questions ($p = 0.0039$; $p = 0.0313$).

References

1. Hamstra S, Philibert I. Simulation in graduate medical education: understanding uses and maximizing benefits. *J Grad Med Educ.* 2012 Dec;4(4):539-40. doi: 10.4300/JGME-D-12-00260.1. PMID: 24294437; PMCID: PMC3546589.
2. Malmut L, Rho ME. Simulation-Based Education for Urgent Medical Complications Common to the Rehabilitation Setting: An Educational Program for Physical Medicine and Rehabilitation Residents. *PM R.* 2019 Dec;11(12):1272-1277. doi: 10.1002/pmrj.12148. Epub 2019 Mar 26. PMID: 30779322.