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Found in transition: Applying milestones to three unique discharge curricula

Introduction: A safe and effective transition from hospital to post acute care is a complex and important physician competency. Milestones and Entrustable Professional Activities (EPA) form the new educational rubric in Graduate Medical Education Training. 'A safe and effective discharge from the hospital' is an EPA ripe for educational innovation. Methods: The authors collaborated in a qualitative process called, mapping, to develop a Q-sort exercise to be distributed to participants at an Association for Program Directors in Internal Medicine (APDIM) workshop on milestones for transition of care. We analyzed the Q-sort results to rank the milestones in order of priority. We then applied this ranking to 3 innovative transitions of care curricula: Simulation (S), Discharge Clinic Feedback (DCF) and TRACER (T). Results: We collected 55 game boards from faculty units at the APDIM workshop. We report the prioritized milestones by Q-sort from the APDIM workshop. From the total 22 milestones, the simulation innovation identified 5/22 milestones, discharge clinic 9/22 milestones and tracer 7/22 milestones related to the EPA. Milestones identified in each innovation related back to one of the top eight prioritized milestones 75% of the time; thus more frequently than the milestones with lower priority. Discussion: We demonstrated that three unique innovations in transitions of care map to the top prioritized Q-sort milestones related to that EPA. Milestones for competency based assessment can be used to guide the development of innovative curricula in transition of care medicine.

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2 Found in transition: Applying milestones to three unique discharge curricula

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43 Found in transition: Applying milestones to three unique discharge training curricula
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45 **Introduction:**

46

47 The ability to safely and effectively manage transitions of care represents a critical new
48 competency for today's internist. Brought to light by the increasingly prevalent separation
49 between inpatient and outpatient services, the medical literature continues to demonstrate that
50 poorly managed transitions of care result in significant medical errors, decreased patient
51 satisfaction and poor patient outcomes (Jenchks 2009; van Wlraven 2002; Kripalani 2007;
52 Forster 2003). Coleman et al describe the fragmentation of care in a landmark paper with the
53 ominous title "Lost in Transition" (Coleman, 2004).

54

55 While practicing internists attempt to master their own transfer of care skills, the academic
56 medical community is challenged by the need to identify and incorporate these skills into an
57 effective transition of care curriculum for trainees. Discharging patients from the hospital, a
58 major transition of care event, is a daily occurrence in the lives of Internal Medicine house-staff,
59 yet medical literature guiding the training, supervision and evaluation of this critical event is
60 limited. Several studies have highlighted innovative curriculum surrounding transitions of care.
61 Self-audits of resident discharge summaries (Dinescu 2011; Talwalkar 2012) and feedback about
62 the discharge summary (Myers 2006; Legault 2012) improved discharge summary targets. A
63 discharge 'time out' (Coit 2010) and reduced house-staff workload also improved discharge
64 summaries (Mohta 2012). A web-based module utilizing a well-designed teaching case
65 emphasized the importance of communication in the transition (Eskildsen 2010). A qualitative
66 study of the resident perspective on the interdisciplinary nature of teamwork revealed "learning

67 by doing” as the foremost theme in 2 residency programs (Greysen 2012). A medical student
68 curriculum using experiential learning that follows a patient through the transition improved
69 confidence (Lai 2008) and was found to be both feasible and effective (Bray-Hall 2010).

70

71 Beyond the challenge of developing a program for training physicians in a new patient care
72 venue, academic internists are facing increasingly rigorous standards for measurable training
73 outcomes. Milestones and Entrustable Professional Activities (EPAs) are an evolving
74 framework for defining the competence of medical trainees. Milestones are discrete observable
75 behaviors that demonstrate the competence (Green 2009). An EPA is an activity that constitutes
76 the mass of critical elements or knowledge, skills and attitudes (KSAs) that operationally define
77 a profession (Ten Cate 2007; Hauer, 2014). The theory of milestones and EPAs have been well
78 described and are beginning to be adopted as best practice goals for IM residency programs but
79 there are few examples in the medical literature illustrating how to effectively turn this
80 educational theory into practice (Nasca 2012; Schmacher 2013).

81

82 The KSAs needed to accomplish a high quality discharge are both complex and challenging thus
83 ripe for the application of this new paradigm of milestones and EPAs. The authors of this report
84 created three unique curricula in transitions of care training of medical resident in their separate
85 institutions prior to 2009, in other words, prior to the publication of the curricular milestones
86 (Green 2009). With a call for using milestones for standard setting, we embarked on a standard-
87 setting process for applying milestones to our three transitions of care curricula across
88 institutions.

89 In 2011, the authors presented an APDIM workshop on the transition of care (Meade 2011) both
90 to describe the individual transitions of care at our institution and to discuss and collect data on
91 workshop participants prioritization of milestones for transitions of care and specifically the
92 EPA, “A safe and effective discharge from the hospital.” After analyzing the Q-sort data we
93 reflected back on our original curricula, using the prioritized milestones as a gold standard to
94 compare and contrast our transition of care program curriculum. This report describes three
95 curricula in the transition of care, the results of the group Q-sort and the application of the
96 prioritized milestones back to the curricula as a way to compare and contrast curriculum in for
97 training in an EPA.

98
99 **Methods:**

100
101 Mapping milestones

102 The authors collaborated in a qualitative process called mapping, to develop a Q-sort exercise for
103 workshop participants related to the EPA, ‘A safe and effective discharge from the hospital’.
104 First, we individually choose 22 milestones of the 142 curricular milestones set that applied to
105 the EPA. Then, over three months, we discussed and deliberated our choices in the group
106 process, in three rounds, until there was agreement on the 22 curricular milestones most related
107 to the EPA. Using these 22 milestones we created a Q-sort exercise to distribute and collect at
108 an APDIM workshop. For the exercise we created cards with curricular milestone on the front
109 and an example of the milestones as it applies to the EPA on the back. In a similar iterative
110 process we also mapped curricular milestones to our individual curricula.

111

112 Prioritizing milestones

113 We distributed the Q-sort exercise for this EPA to participants at the APDIM workshop.

114 Participants were Internal Medicine program faculty who worked in groups of 2-3, called

115 participant units, to prioritize the milestones for the EPA. Participants were given instructions

116 on how to rank the milestones by Q-sort methodology. Q-sort methodology enables researchers

117 with some limitation to study subjectivity using a combination of qualitative and quantitative

118 methods (Kampen, 2013). It prioritizes the opinions of an observer (Brown, 1996) and provides

119 an organized means of identifying priorities and areas of divergent opinions among a group

120 (Valenta, 1997). In a Q-sort, the observer rank-orders a set of statements from most important to

121 least important, using an inverted quasi-normal distribution (Brown, 1996; van Exel, 2005). The

122 sample of statements (the Q sample) may represent an existing framework, in this case the 22

123 milestones related to the EPA (Brown, 1996; van Exel, 2005). Thus, the statements are the unit

124 of analysis; the number of observers is less important than is their theoretical relevance to the

125 topic (Valenta, 1997). Once sorted, statements are analyzed by rank category with a standard

126 deviation. The Q-sort method uses a mathematical substructure to reveal priorities of subjective

127 viewpoints of the observers. The results of the Q-sort can be used to describe the sample of

128 viewpoints, in this case in terms of prioritization of milestones, rather than the sample of

129 observers (van Exel, 2005).

130 We analyzed the Q-sort results by calculating the mean rank order of milestones by faculty units.

131 With this mean ranking we listed the milestones in order of priority. We identified the top 8

132 milestones because, by Q-sort methodology, the top 8 milestones confer those milestones more

133 than neutral status in the normal distribution. We calculated the proportion of milestones used of

134 the total 22 milestones in the curriculum for each program. With each innovation we calculated

135 the proportion of milestones that were in the top 8 compared to the total. We then considered the
136 milestones in common between curricula both in the total 22 milestones and in the top 8
137 milestones to look for trends.

138

139 **Results**

140 First we will describe the milestones as they were mapped to each transitions of care program.

141 Then we will describe the Q-sort exercise results. Finally we will reflect on our individual
142 curricula using the prioritized milestones as a standard for curriculum.

143

144 **Mapping Milestones**

145 In this section we will briefly describe the individual transitions of care curricula and the results
146 of mapping the milestones to each program.

147

148 **Simulation**

149 SIU is a small University program in Springfield Illinois with one academic ambulatory site and
150 two affiliate hospitals. During an Objective Structured Systems-Interaction Exam or

151 simulation, residents are observed discharging a patient from the hospital and evaluated on how

152 well they demonstrated the following observable behaviors: Use of the Situation, Background,

153 Assessment, Recommendation format to notify the Anti-Coagulation clinic of the patient's

154 Warfarin levels and dose, Use of Electronic Health Record to document medication changes,

155 Use of the Hospital's medication reconciliation form and Legibility and Accuracy of written

156 prescriptions. Five of the 22 curricular milestones are identified for the simulation curriculum:

157 PC C1, Synthesize all available data; IPC A5, Utilize patient-centered education strategies;

158 IPC F2, Ensure succinct, relevant, and patient-specific written communication; P A1,
159 Document and report clinical information truthfully; SBP B1, Appreciate roles of a variety of
160 health care providers.
161
162 Discharge clinic feedback
163 Hennepin County Medical Center is a moderate sized academic training program in
164 Minneapolis, Minnesota with one ambulatory clinic and one hospital affiliate. This innovation
165 targets the nine primary care track residents in the program. A discharge clinic feedback
166 provides patients with pharmacist assisted medication reconciliation, lab and radiology testing
167 follow-up and appointment confirmation. The resident evaluates the quality of the discharge
168 and gives feedback to the ward team resident who discharged the patient. This evaluation
169 includes direct feedback from the patient regarding the discharge processes as well as structured
170 feedback on the written discharge summary. Nine of the 22 curricular milestones are identified
171 for the discharge clinic feedback curriculum: SBP A2, Manage and coordinate care and care
172 transitions across multiple delivery systems; IPC A5, Utilize patient-centered education
173 strategies; IPC F2, Ensure succinct, relevant, and patient-specific written communication; PC
174 F10, Customize care in the context of the patient's preferences and overall health; PC C3,
175 Modify differential diagnosis and care plan based upon clinical course and data as appropriate;
176 PC B2, Accurately track important changes in the physical examination; P D2, Carry out timely
177 interactions with colleagues, patients and their designated caregivers; PBLI F1, Respond
178 welcomingly and productively to feedback from all members of the health care team; PBLI A3,
179 Reflect on audit compared with local or national benchmarks.
180

181 Tracer

182 Baystate Medical Center, Springfield MA, is a moderate sized academic training program with

183 one academic ambulatory site and one large hospital affiliate. In a two-week experiential block

184 rotation, the TRAnsitions of Care Rotation (Tracer) follows the ward team patient into the Post-

185 Acute Care (PAC) settings including home, rehabilitation, and long-term care. Follow up

186 includes a visit to the patient in PAC and a formal assessment of the transition, using tools

187 modified from the transition of care literature. This data is communicated in aggregate to the

188 hospital PAC Performance Improvement team, to the ward team, at inter-professional attending

189 rounds, and at morning report. Seven curricular milestones are identified for the Tracer

190 curriculum: IPC C1, Effectively communicate with other caregivers during transitions of care;

191 SBP A2, Manage and coordinate care and care transitions across multiple delivery systems.; IPC

192 D3, Engage in collaborative communication with all members of the health care team; IPC A5,

193 Utilize patient-centered education strategies; IPC F2, Ensure succinct, relevant, and patient-

194 specific written communication; PC F10, Customize care in the context of the patient's

195 preferences and overall health; SBP B1, Appreciate roles of a variety of health care providers.

196

197 **Prioritizing and applying milestones**

198 We collected 55 game boards from faculty units at the APDIM workshop. We report the

199 prioritized milestones by Q-sort from the APDIM workshop (Table 1) on transitions of care. The

200 priority range for the top eight prioritized milestones is 4.2 – 5.7 (SD 0.97 -1.84). From the total

201 22 milestones, the simulation innovation identified 5/22 milestones, discharge clinic 9/22

202 milestones and tracer 7/22 milestones related to the EPA. We considered two tiers of milestones.

203 We emphasize the top eight milestones in our analysis for reasons described in the methods.

204 Milestones identified in each innovation related back to one of the top eight prioritized
205 milestones 75% of the time; thus more frequently than the milestones with lower priority. Four
206 of the top eight milestones were shared by curricula. Two milestones are shared by all three
207 curricula: IPC A5, utilize patient-centered education and IPC F2, ensure succinct, relevant, and
208 patient-specific written communication. Two other milestones are shared by two curricula: SBP
209 A2, Manage and coordinate care and care transitions across multiple delivery systems and PC
210 F10, Customize care in the context of the patient's preferences and overall health. Alternatively,
211 few milestones are in the lower priority milestones set and there is only one milestone shared by
212 more than a single program in the lower priority milestones ie SBP B1, appreciate roles of a
213 variety of health care providers, including, but not limited to, consultants, therapists, nurses,
214 home care workers, pharmacists, and social workers. If you combine the three innovations
215 together, all of the top eight milestones are included.

216

217 **Conclusion:**

218 In a learning community of innovative educators, we identified the transition of care curriculum
219 as important, largely lacking, and challenging to develop. Three curricula mapped their
220 individual program innovations to the new assessment framework of milestones related to the
221 EPA "A safe and effective discharge from the hospital." We found that the milestones in our
222 individual curricula had a strong correlation with milestones identified for our chosen EPA,
223 using a Q sort derived standard.

224

225 A limitation of this collaboration is its retrospective look at innovation in a new framework.

226 The retrospective aspect is a historical phenomenon ie these curricula existed prior to the

227 milestones framework. Although non-traditional, this retrospective look allows for an inquisitive
228 matching of milestones across program innovation. Another limit is that the authors each rated
229 the milestones associated with their own program without a peer or participant checker or a
230 group vetting process. Nonetheless, there is no other literature in comparing innovative curricula
231 in a specific EPA in the context of the milestones. This work is useful for future prospective
232 work on educational assessment of the Transition of Care.

233
234 The transition of care remains a challenge to the patient, the health care system and to training
235 programs. Tools related to the assessment of “a safe and effective discharge from the hospital”
236 help narrow the current training gap. Programs may apply one or all of the transitions of care
237 curricula described. Alternatively, programs may consider applying the top 8 milestones
238 defined by the prioritization method, Q-sort, to an already existing program in transition of care;
239 thereby, assessing the relevance of their curriculum to a benchmark. Establishing a list of
240 milestones for an EPA can occur siloed at each individual program or in collaborative groups.
241 The Q-sort method may have a role the process as we develop standards for EPA in medical
242 education. Milestones are a new training rubric for measurable outcomes and competency based
243 promotion. We need innovative ways to apply milestones and EPA’s to curriculum (Hauer
244 2013). The milestones give us a context to share individual innovations and compare and
245 contrast using a standardized frame.

246

247

248 **Perspective viewpoints:**

249

- 250 ▪ The Entrustable Professional Activity (EPA), a safe and effective discharge from the
- 251 hospital, is ripe for educational innovation and collaboration.
- 252 ▪ Using Q-sort methodology to prioritize curricular milestones for this discharge EPA, we
- 253 compare and contrast three unique discharge curricula: simulation, discharge clinic and
- 254 tracer.
- 255 ▪ We demonstrate that the three unique discharge curricula in aggregate capture all of the
- 256 highest prioritized milestones for this discharge EPA.

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Table 1: Milestones for the EPA "A safe and effective discharge"

	Priority	SD	Milestones Abbreviated	Example	Top 8 Q-sort		S	DCF	T
IPC C1	5.78	0.97	Effectively communicate with other caregivers during transitions of care	Communicates with the PCP or nursing home at discharge.	X				X
SBP A2	5.52	1.16	Manage and coordinate care and care transitions across multiple delivery systems.	Works with the case manager to make appropriate decisions about where a patient should go after discharge ie home with nursing services or to a nursing home.	X			X	X
PC C1	4.89	1.25	Synthesize all available data	Able to synthesize a complicated hospital course.	X		X		
IPC D3	4.74	1.35	Engage in collaborative communication with all members of the health care team	Seeks out the nurse and case manager about the plan for discharge.	X				X
IPC A5	4.56	1.63	Utilize patient-centered education strategies	Explains the primary diagnosis to the patient at discharge and uses teach back to check for understanding.	X		X	X	X
IPC F2	4.48	1.31	Ensure succinct, relevant, and patient-specific written communication	A succinct discharge summary with key components.	X		X	X	X
P A1	4.48	1.85	Document and report clinical information truthfully	Really did call the pharmacy to confirm the medication list if they say they have.	X		X		
PC F10	4.26	1.20	Customize care in the context of the patient's preferences and overall health	Offers home care or nursing home care depending on patient preferences.	X			X	X
PC C3	4.15	1.17	Modify differential diagnosis and care plan based upon clinical course and data as appropriate	If the patient is admitted with presumed pneumonia but the clinical course is consistent with CHF then this resident identifies CHF as the final diagnosis and is able to explain why it is not pneumonia.				X	
P il	4.15	1.29	Treat patients with dignity, civility and respect, regardless of race, culture, gender, ethnicity, age or socioeconomic status	Makes special accommodations for a homeless patient such as having social work assist with clothing, food and/or shelter.					
PC B2	3.96	1.22	Accurately track important changes in the physical examination	Documents the mental status physical exam upon discharge for a patient admitted with altered mental status.				X	

357
358

Table 1: Milestones for the EPA "A safe and effective discharge" (continued)

	Priority	SD	Milestones Abbreviated	Example	Top 8 Q-sort		S	DCF	T
PC A2	3.93	1.17	Seek and obtain appropriate, verified, and prioritized data from secondary sources	Verifies the medication list with the pharmacy or PCP.					
P D2	3.74	1.16	Carry out timely interactions with colleagues, patients and their designated caregivers	Completes the discharge summary within 24 hours of discharge.				X	
MK A9	3.70	1.14	Demonstrate sufficient knowledge of socio-behavioral sciences	Has the knowledge that a patient without health insurance may have many barriers to transition of care such as cost of medications, access to PCP, and poor health literacy.					
IPC A4	3.70	1.27	Engage patients/advocates in shared decision-making for uncomplicated diagnostic and therapeutic scenarios	Checks with the patient about the convenience of the follow up appointment.					
SBP B1	3.58	1.30	Appreciate roles of a variety of health care providers	Uses the home nurse for to assist with education of the primary diagnosis and medication reconciliation after discharge.			X		X
PBLI F1	3.50	1.17	Respond welcomingly and productively to feedback from all members of the health care team	Responds to nursing concerns about readiness for discharge.				X	
IPC E3	3.50	1.21	Communicate consultative recommendations to the referring team in an effective manner	Includes the name and recommendations of a consultant in the discharge summary.					
SBP E3	3.41	1.47	Demonstrate the incorporation of cost-awareness principles	Uses the antibiotic that is most appropriate but also affordable to the outpatient at discharge.					
P J1	3.11	1.45	Maintain patient confidentiality	Knows to get permission from the patient or their health care proxy to disclose any medical information.					
P F7	2.54	1.27	Recognize the need to assist colleagues in the provision of duties	A supervising resident who does a discharge for an intern because it is too complex for that intern.					
PBLI A3	2.41	1.12	Reflect on audit compared with local or national benchmarks	Is aware of the high risk concerns for re-admission.				X	

359

360 Abbreviations: Interpersonal communication (IPC), Systems based practice (SBP) , Patient care (PC),

361 Professionalism (P) , Medical knowledge (MK), Problem based learning and improvement (PBLI),

362 Simulation (S) , Discharge clinic feedback (DCF), Tracer (T)

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364