Figure 19. FACTOR FOUR TASK HIERARCHY (continued)
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Task Code No.	Abbreviated Name of Task	Current Titles[a]	Frequency[b]	Loading on Factor[c]
26	Participating in committees at institution.	INT PED	2 6	-.27
239	Participating in Family Health Team conference as Family Health Worker.	FHW	4	-.22
127	Work schedules planned and approved re pts.	MP	6	-.22
23	Filling in forms and letters describing patient's medical condition for institutions.	INT OB-GYN PED	6 6 7	-.19
111	Safety inspection of patient's home.	NP	3	-.18
241	Providing job orientation to new co-worker Family Health Worker.	FHW	2	-.16
219	Accompanying patient to any social agency.	FHW	3	-.14
122	Coordinating multi-agency exams for patient.	NP	4	-.11
252	Conducting routine exam of chronic disease pt.	FHW	4	-.11
148	Answering patients' phone questions at LPN capability.	LPN-U	3	-.10
154	Participating in Unit conference as LPN.	LPN-U	3	-.10
249	Conducting routine post partum exam.	FHW	3	-.08
203	Reinforcing diet and making ethnic substitutes.	LPN-U FHW	3 6	-.07
158	Informally evaluating and teaching subordinate Med. Assts.	LPN-U	6	-.06
237	Discussing consumer protection and helping patient with budgeting.	FHW	4	-.06
245	Orienting and taking intake information from new family.	FHW	4	-.06

Figure 19. FACTOR FOUR TASK HIERARCHY (continued)
p. 3 of 5

Task Code No.	Abbreviated Name of Task	Current Titles[a]	Frequency[b]	Loading on Factor[c]
226	Giving basic sex education, contraception and abortion information.	FHW	4	-.03
[d]100	Giving Denver Development test for child.	NP	4	-.03
246	Reviewing intake information on family, assessing priority of problems.	FHW	4	-.03
159	Following up on no-show patient and arranging new appointment.	LPN-U	3	-.02
238	Deciding patient needs homemaking services and doing.	FHW	4	-.01
[d]202	Giving introductory information on birth control devices, on orders.	LPN-U	6	-.01
124	Checking and assessing subordinates' attendance.	NP	6	-.00
197	Reinforcing prescribed diet and medication.	LPN-E	6	.00
228	Teaching TB patient and family proper health practices.	FHW	3	.00
221	Making oral presentation on good health practices to community people.	FHW	1	.00
255	Contributing opinion at Unit conference as Medical Assistant.	MA-U	4	.01
[d]258	Reinforcing patient in use of contraceptive.	MA-U	6	.02
240	Deciding and arranging appointment for patient at Center.	FHW	6	.03
131	Assigning staff to treatment rooms.	LPN-U LPN-E	6 6	.03
261	Answering telephone in Unit and taking message.	MA-U	4	.03
253	Following up on patient discharged from hospital.	FHW	3	.03

Figure 19. FACTOR FOUR TASK HIERARCHY (continued)
p. 4 of 5

Task Code No.	Abbreviated Name of Task	Current Titles	Frequency[b]	Loading on Factor[c]
94	Assessing tine test after time lapse and following up on results.	NP	3	.04
77	Monitoring functions and work of X-ray dept.	X-ray	8	.04
234	Delivering medicine to patient and explaining how to take as ordered.	FHW	4	.04
259	Taking partial history from patient.	MA-U	6	.04
107	Teaching patient self exam and care of breasts.	NP	6	.05
116	Deciding whether to provide patient with transportation.	NP FHW	3 8	.05
138	Noticing and reporting relevant patient symptoms to Dr.	LPN-U MA-U	8 8	.05
247	Deciding whether family that moved stays with Family Health Team.	FHW	6	.06
204	Providing orientation tour of facilities and procedures at Center.	LPN-U FHW	2 2	.06
211	Teaching how to bathe and diaper infant.	FHW	3	.06
254	Planning a weekly work schedule for aproval.	FHW	6	.06
[d]215	Teaching how to prepare infant formula.	FHW	3	.06
126	Aproving or changing requisition forms of subordinates.	NP	4	.07
113	Giving general reassurance to any patient.	NP LPN-U LPN-E FHW MA-U	8 8 9 8 8	.07
216	Teaching bottle feeding and burping to new mother.	FHW	3	.07

Figure 19. FACTOR FOUR TASK HIERARCHY (continued)
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Task Code No.	Abbreviated Name of Task	Current Titles[a]	Frequency[b]	Loading on Factor[c]
106	Teaching patient postural drainage technique.	NP	1	.07
225	Checking patient's medicines and having old ones discarded.	FHW	3	.07
208	Collecting stool specimen and taking to lab.	FHW	2	.07

[a] Radiologist = RAD; Internist = INT; Obstetrician-Gynecologist = OB-GYN; Pediatrician = PED; Lead X-ray Tech. and X-ray Tech. = X-ray; Nurse Practitioner = NP; LPN-Unit = LPN-U; LPN-Emergency = LPN-E; Family Health Worker = FHW; Medical Assistant-Unit = MA-U; EKG Tech. = EKG; Dark Room Aide = DRA.

[b] Numbers refer to scale values of the Task Frequency Scale. (B.3).

[c] Loadings represent the degree to which task partakes of factor. Loadings are not standardized, and sign has no intrinsic meaning except for change from high on one, passing through zero, to opposite sign, as continuous hierarchy.

[d] Task actually loads higher on another factor. Consider variables determining factor for placement here.

viated name does not make this obvious. Sensitivity to others' needs and conditions is an overriding requirement for most of the tasks.

It is worth noting that the LPN and Medical Assistant also have tasks appearing on this factor. It is also interesting that monitoring or semi-supervisory tasks such as 127, 131, 77 and 254 are involved in this factor. The knowledge needed for the tasks being supervised were not as needed as the skills required for the interactions of supervision.

Figure 20 contains the 90 tasks of Factor Five. This factor contains many of the traditional nursing tasks, but indicates that the skills and knowledge required for injections, colostomy care, catheterization and bandaging are carried through to higher levels in suturing, doing bone marrow punctures, spinal taps and, finally, in emergency life support care. The factor focuses attention on the extent to which this factor, which is essentially a treatment factor, relates to Factors One and Two which are diagnosis and prescription factors. The emphasis in Factor Five is on the "laying on of hands," of handling emergencies, injuries and in carrying out prescribed care.

There are a great variety of tasks at each level. The factor suggests the possibility that a patient might benefit more from having taps, punctures and injections done by specialized persons who have constant practice in the skills (provided they are properly educated) than from having these done by physicians who may have little of such practice -- provided the prescription and decision "to do" stays with the physician.

Figure 20. FACTOR FIVE TASK HIERARCHY:
PHYSICAL CARE AND TREATMENT SPECIALTY
p. 1 of 6

Task Code No.	Abbreviated Name of Task	Current Titles[a]	Frequency[b]	Loading on Factor[c]
[d]28	Emergency life support care.	INT PED	1 2	-.73
37	Treatment of injuries.	INT PED	1 6	-.56
60	Spinal tap from pediatric patient.	PED	4	-.54
62	Bone marrow sample from pediatric patient.	PED	1	-.48
22	Responding to cardiac arrest call; providing care.	INT	1	-.44
50	Taking sample of amniotic fluid from pregnant patient.	OB-GYN	4	-.44
30	Spinal tap from adult patient.	INT	1	-.41
32	Suturing lacerations.	INT PED	1 6	-.39
41	Cauterize; cervical biopsy; polyps; IUD; retroflexed uterus: vaginal care.	OB-GYN	3	-.32
61	Drawing blood from pediatric patient's vein.	PED	6	-.31
91	Administering first aid in emergency.	NP FHW	2 2	-.30
31	Bone marrow specimen from adult patient.	INT	2	-.30

[a] Radiologist = RAD; Internist = INT; Obstetrician-Gynecologist = OB-GYN; Pediatrician = PED; Lead X-ray Tech. and X-ray Tech. = X-ray; Nurse Practitioner - NP; LPN-Unit = LPN-U; LPN-Emergency = LPN-E; Family Health Worker = FHW; Medical Assistant-Unit = MA-U; EKG Tech. = EKG; Dark Room Aide = DRA.

[b] Numbers refer to scale values of the Task Frequency Scale. (B.3).

[c] Loadings represent the degree to which task partakes of factor. Loadings are not standardized,and sign has no intrinsic meaning except for change from high on one, passing through zero, to opposite sign,as continuous hierarchy.

[d] Task actually loads higher on another factor. Consider variables determining factor for placement here.

Figure 20. FACTOR FIVE TASK HIERARCHY (continued)
p. 2 of 6

Task Code No.	Abbreviated Name of Task	Current Titles[a]	Frequency[b]	Loading on Factor[c]
87	Evaluating or following routine prescribed treatment or care.	NP	8	-.30
12	Removing a wart from non-child patient.	INT	2	-.26
17	Determining if suspect EKG reading is true or artifact.	INT PED	3 6	-.24
19	Determining allergy to dye for IVP X-rays.	INT	6	-.23
34	Incising and draining abcess or boil.	INT PED	1 4	-.22
59	Removing large blunt object from pharynx.	PED	1	-.19
33	Removing sutures.	INT OB-GYN PED	2 3 3	-.16
250	Conducting routine neonate examination.	FHW	3	-.13
13	Setting up and teaching IV apparatus for non-child patient.	INT	2	-.13
5	Instillation portion of hysterosalpyngography.	RAD	3	-.12
105	Irrigating,dressing, bandaging wound or burn as appropriate.	NP	4	-.10
171	Assessing urgency of need for MD to see emergency patient.	LPN-E	7	-.09
38	Removing foreign object from eye and/or ear.	INT	2	-.09
18	Drawing blood from non-child patient's vein.	INT NP	1 2	-.08
112	Teaching diabetic medication or insulin injection.	NP	3	-.06
156	Cleaning, dressing, bandaging wounds as ordered.	LPN-U LPN-E	4 6	-.06
192	Assisting in emergency by preparing materials.	LPN-E	6	-.05

Figure 20. FACTOR FIVE TASK HIERARCHY (continued)
p. 3 of 6

Task Code No.	Abbreviated Name of Task	Current Titles[a]	Frequency[b]	Loading on Factor[c]
167	Preparing and administering subcutaneous or intramuscular injections on orders.	LPN-E	8	-.05
133	Preparing, administering, explaining subcutaneous or intramuscular injection as ordered.	LPN-U	8	-.04
251	Conducting routine exam of any patient over six months of age.	FHW	4	-.03
57	Removing foreign object from patient's ear.	PED	3	-.03
117	Irrigating and changing indwelling catheter.	NP	4	-.02
143	Obtaining urine specimen from female using catheter.	LPN-U LPN-E	2 1	-.02
92	Removing thread stitches if appropriate.	NP	2	-.01
119	Teaching infant's formula, feeding, bathing, diapering.	NP	3	-.00
243	Taking and recording vital signs; notifying MD of abnormalities.	FHW	4	.00
232	Helping any patient needing assistance in walking.	FHW	3	.00
118	Teaching patient irrigation of catheter.	NP	3	.01
58	Preparing patient with foreign body in eye by applying dye strip.	PED	3	.01
104	Administering common range of motion exercise on orders.	NP	2	.01
109	Teaching irrigation, change, care of colostomy.	NP	1	.01
218	Bandaging or changing bandage for minor wound as ordered.	FHW MA-U	3 4	.02
191	Applying splint on orders.	LPN-E	6	.03
179	Preparing intravenous bottle.	LPN-E	6	.03

Figure 20. FACTOR FIVE TASK HIERARCHY (continued)
p. 4 of 6

Task Code No.	Abbreviated Name of Task	Current Titles[a]	Frequency[b]	Loading on Factor[c]
229	Changing colostomy bag, irrigating on orders.	FHW	1	.03
152	Administering prepacked smallpox vaccine on orders.	LPN-U LPN-E	8 2	.03
185	Assisting in administration of oxygen on orders.	LPN-E	6	.03
210	Bathing any adult bedridden patient.	FHW	3	.04
215	Teaching how to prepare infant formula.	FHW	3	.04
206	Examining, treating bedridden patient for bed sores.	FHW	4	.05
163	Preparing materials for special procedures.	LPN-U	2	.05
224	Deciding to make an occupied bed and making.	FHW	3	.05
173	Preparing patient for suturing.	LPN-E	8	.05
244	Teaching temperature taking and care of thermometer.	FHW	4	.05
199	Preparing patient and taking vital signs before Dr.'s examination.	LPN-U LPN-E MA-U	8 8 8	.06
93	Applying prepackaged tine test for TB.	NP LPN-U LPN-E FHW MA-U	6 8 7 3 7	.06
200	Applying hot or cold compress on Dr.'s orders.	LPN-U FHW	2 3	.06
201	Giving cold water or alcohol rub on Dr.'s orders.	LPN-U MA-U	2 4	.06
162	Irrigating ear with solution as ordered.	LPN-U LPN-E MA-U	3 6 1	.06
142	Administering rectal medication as ordered.	LPN-U LPN-E	4 6	.07

Figure 20. FACTOR FIVE TASK HIERARCHY (continued)
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Task Code No.	Abbreviated Name of Task	Current Titles[a]	Frequency[b]	Loading on Factor[c]
95	Tablet or dipstick urine test.	NP	4	.07
		LPN-U	3	
		LPN-E	6	
		FHW	4	
		MA-U	6	
96	Taking throat culture specimen; labeling.	NP	4	.07
		LPN-U	4	
		LPN-E	7	
		FHW	2	
		MA-U	6	
205	Giving patient enema on doctor's orders.	FHW	2	.07
190	Assisting patient to or from wheelchair.	LPN-E	6	.07
		FHW	4	
194	Administering eye or ear drops on orders.	LPN-E	2	.07
233	Teaching pt. how to irrigate eye with water.	FHW	1	.07
177	Treating patient for ringworm on Dr.'s orders.	LPN-E	1	.07
188	Applying cold towels or ice bath to patient for fever on orders.	LPN-E	4	.07
209	Giving alcohol bath for fever; reporting if no effect.	FHW	3	.08
212	Assisting any non-infant patient to bathe or shower.	FHW	3	.08
195	Applying eye patch on orders.	LPN-E	6	.08
187	Giving oral medication to patient.	LPN-E	7	.08
189	Treating patient for lice on orders by shampooing.	LPN-E	2	.08
256	Administering prepacked polio vaccine on orders.	MA-U	6	.08
161	Weighing and measuring patient and recording.	LPN-U	8	.09
		LPN-E	6	
		MA-U	8	
170	Assisting patient in dressing.	LPN-E	8	.09

Figure 20. FACTOR FIVE TASK HIERARCHY (continued)
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Task Code No.	Abbreviated Name of Task	Current Titles[a]	Frequency[b]	Loading on Factor[c]
198	Administering oral medication and explaining effects on Dr.'s orders.	LPN-U	4	.09
217	Preparing food, feeding non-infant patient.	FHW	2	.09
213	Treating baby for cradle cap.	FHW	2	.10
166	Assembling suture materials as ordered.	LPN-E	6	.10
260	Preparing hypodermic on orders.	MA-U	4	.10
180	Preparing tray for drawing blood; writing labels.	LPN-E	6	.10
181	Preparing tray for nasal packing.	LPN-E	6	.10
153	Assisting Dr. in medical exam with materials.	LPN-U MA-U	3 7	.10
193	Preparing for bone marrow puncture on orders.	LPN-E	1	.10
183	Inducing vomiting in patient on Dr.'s orders with medication.	LPN-E	2	.10
182	Preparing patient for gastric lavage and assisting.	LPN-E	1	.10
214	Shampooing patient with itchy scalp.	FHW	3	.10

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[b] Numbers refer to scale values of the Task Frequency Scale. (B.3).

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[d] Task actually loads higher on another factor. Consider variables determining this factor for placement here.

It should also be noted that task 5, instillation of a radiopague dye into the cavity of the female reproductive organs, need not be done by a radiologist as is now the case.

Figure 21 is the Factor Six Specialty in Female Care. It seems to bring together tasks which are found in Factors Four and Five, and reflects their skills and knowledges. The sequence of tasks begins at Level 3, and is therefore able to provide an opportunity to specialize for persons in the other factors at lower levels or at the same level.

It is interesting to note that the neonate examination falls on this factor rather than on Factor Two, and that the instillation task currently done by the Radiologist also appears here (at Level 4).

The reason that task 43 (normal delivery) appears at a high level on this factor is because this task includes the response to emergencies such as a need to change to Caesarian section. Were this a nurse-midwife task, for example, it would probably appear at Level 5.

Figure 22 presents the groupings of tasks which were not assigned to factors. The first set was grouped together because all the tasks seem to deal with laboratory or chemical procedures and appear to be the basis for a laboratory factor were such titles included in the pilot test. These tasks might be joined by tasks 15, 16, and 51 which now appear on Factor Six by virtue of the female-related knowledge involved. Tasks 36, 14 and 35 require some technical training; the other tasks of the group require little special training.

Figure 21.

FACTOR SIX TASK HIERARCHY:
SPECIALTY IN FEMALE CARE
p. 1 of 2

Task Code No.	Abbreviated Name of Task	Current Titles[a]	Frequency[b]	Loading on Factor[c]
54	Participating in Ob-gyn physician conference.	OB-GYN	4	-1.01
52	Contributing to Family Health Team as Ob-gyn.	OB-GYN	2	-.99
[d]43	Delivery of baby through vagina.	OB-GYN	3	-.62
[d]42	Providing fertility assistance for female pt.	OB-GYN	4	-.57
86	Prenatal exam of pregnant patient; reporting abnormalities.	NP	6	-.47
85	Providing post-partum exam; evaluating condition.	NP	3	-.41
89	Assessing condition of neonate and follow-up.	NP	4	-.35
[d]50	Taking sample of amniotic fluid from pregnant patient.	OB-GYN	4	-.31
[d]41	Cauterize; cervical biopsy; polyps; IUD; retroflexed uterus: vaginal care.	OB-GYN	3	-.29
248	Conducting routine prenatal exam.	FHW	4	-.14
[d]101	Counseling in sex, contraception, VD, abortion.	NP	6	-.14

[a] Radiologist = RAD; Internist = INT; Obstetrician-Gynecologist = OB-GYN; Pediatrician = PED; Lead X-ray Tech. and X-ray Tech. = X-ray; Nurse Practitioner = NP; LPN-Unit = LPN-U; LPN-Emergency = LPN-E; Family Health Worker = FHW; Medical Assistant-Unit = MA-U; EKG Tech. = EKG; Dark Room Aide = DRA.

[b] Numbers refer to scale values of the Task Frequency Scale. (B.3).

[c] Loadings represent the degree to which task partakes of factor. Loadings are not standardized,and sign has no intrinsic meaning except for change from high on one, passing through zero, to opposite sign,as continuous hierarchy.

[d] Task actually loads higher on another factor. Consider variables determining this factor for placement here.

Figure 21. FACTOR SIX TASK HIERARCHY (continued)
p. 2 of 2

Task Code No.	Abbreviated Name of Task	Current Titles[a]	Frequency[b]	Loading on Factor[c]
84	Performing pelvic exam on adult female including specimens and follow-up.	NP	6	-.08
[d]5	Instillation portion of hysterosalpyngography.	RAD	3	-.08
11	Performing routine pelvic exam on adult female patient.	INT	4	-.07
202	Giving intro. information on birth control devices on orders.	LPN-U	6	-.03
226	Giving basic sex education, contraception and abortion information.	FHW	4	-.03
[d]250	Conducting routine neonate examination.	FHW	3	-.03
258	Reinforcing patient in use of contraceptive.	MA-U	6	.00
[d]249	Conducting routine post-partum exam.	FHW	3	.01
103	Measuring, fitting diaphragm for female patient.	NP	3	.02
51	Determining presence of monilia fungi on slide.	OB-GYN	6	.03
16	Examining a slide for gonococci.	INT PED	2 2	.03
[d]143	Obtaining urine specimen from female using catheter.	LPN-U LPN-E	2 1	.04
15	Determining presence of trichomonas on slide.	INT OB-GYN PED	2 3 3	.04
[d]117	Irrigating and changing indwelling catheter.	NP	4	.04
[d]118	Teaching patient irrigation of catheter.	NP	3	.04
[d]107	Teaching patient self exam and care of breasts.	NP	6	.06

Figure 22. TASK GROUPINGS UNASSIGNED TO FACTORS
p. 1 of 3

Task Code No.	Abbreviated Name of Task	Current Titles[a]	Frequency[b]
	14 LABORATORY RELATED TASKS		
36	Examining blood slide.	INT	2
		PED	6
14	Evaluating a skin specimen slide for fungi.	INT	2
		PED	4
35	Examining spun-down urine sediment and supernate.	INT	3
		PED	4
139	Assessing results of tine test.	LPN-U	8
		LPN-E	7
		FHW	3
		MA-U	7
207	Testing plaster in home for lead; and reporting positive finding.	FHW	3
172	Taking stool specimen and testing for blood.	LPN-E	6
141	Testing stool specimen for blood using tablet.	LPN-U	1
		MA-U	6
98	Obtaining clean catch urine specimen.	NP	4
		LPN-U	7
		LPN-E	7
		MA-U	6
108	Teaching patient reagent or dipstick urine test.	NP	2
140	Teaching how to do urine test using tablet.	LPN-U	3
		MA-U	6
155	Obtaining urine specimen; preparing for lab.	LPN-U	7
		MA-U	8
97	Teaching or collecting specimen for pinworm test.	NP	2
		FHW	2
147	Preparing patient for pelvic exam; preparing slides.	LPN-U	8
		LPN-E	7
		MA-U	6
196	Giving patient enema kit and instructions for use.	LPN-E	6

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[b] Numbers refer to scale values of the Task Frequency Scale. (B.3).

Figure 22. TASK GROUPINGS UNASSIGNED TO FACTORS (continued)
p. 2 of 3

Task Code No.	Abbreviated Name of Task	Current Titles[a]	Frequency[b]
	9 ADMINISTRATIVE TASKS		
165	Monitoring subordinates' attendance and reporting excesses.	LPN-U	1
186	Explaining work area to new worker.	LPN-E	4
242	Discussing job description accuracy.	FHW	4
157	Checking chart for entry of lab results.	LPN-U	8
		MA-U	8
134	Tallying information on services provided.	LPN-U	4
164	Filling out forms with ID information.	LPN-U	4
		MA-U	7
220	Calling person to phone or writing message.	FHW	8
160	Escorting patient within institution.	MA-U	6
75	Translating Spanish-English conversation.	X-ray	7
		LPN-U	7
		FHW	7
		MA-U	7
	19 INVENTORY AND SUPPLY RELATED TASKS		
76	Collecting information about and ordering supplies.	X-ray	4
128	Deciding order for non-medicinal supplies.	LPN-U	4
		LPN-E	4
		EKG	2
129	Deciding order for non-narcotic supplies.	LPN-U	6
		LPN-E	4
235	Judging what supplies are needed and requesting.	FHW	8
		DRA	4
150	Checking medications for expiration dates.	LPN-U	3
		LPN-E	3
264	Ordering duplicate copies of forms	EKG	6
136	Checking and storing delivered supplies.	LPN-U	4
		LPN-E	4
130	Obtaining pharmaceuticals as ordered and storing.	LPN-U	6
151	Preparing treatment room by cleaning up and stocking supplies.	LPN-U	4
		MA-U	6
176	Removing sterilized equipment from autoclave; storing.	LPN-E	9
266	Placing and arranging non-drug supplies.	EKG	3
80	Preparing materials for IVP-dye allergy test.	X-ray	4
230	Preparing materials for use in a catheter irrigation.	FHW	2
137	Delivering cultures and specimens to incubator or lab.	LPN-U	4
		MA-U	7
168	Taking throat cultures to Dr. from incubator, for assessment.	LPN-E	4
169	Collecting Dr.'s assessments of throat cultures.	LPN-E	6

Figure 22. TASK GROUPINGS UNASSIGNED TO FACTORS (continued)
p. 3 of 3

Task Code No.	Abbreviated Name of Task	Current Titles[a]	Frequency[b]
	19 INVENTORY AND SUPPLY RELATED TASKS (continued)		
231	Delivering and/or picking up forms and supplies.	FHW	3
		EKG	
265	Filing or pulling records of patient.	EKG	4
184	Locking-unlocking narcotic supplies.	LPN-E	6
	18 MACHINE RELATED AND HOUSEKEEPING TASKS		
135	Readying treatment room by wiping up and cleaning.	LPN-U	8
		LPN-E	7
		MA-U	8
145	Preparing equipment for autoclave by washing and wrapping.	LPN-U	4
		MA-U	6
175	Preparing equipment for autoclave by wrapping.	LPN-E	6
178	Wrapping sterile equipment removed from sterilizer.	LPN-E	7
149	Sterilizing equipment in hot water sterilizer.	LPN-U	6
		MA-U	6
174	Washing and placing equipment in sterilizer.	LPN-E	8
70	Preparing hand developing tank for X-ray film.	X-ray	3
		DRA	4
2	Loading or unloading film in fluoroscopy machine.	RAD	4
268	Checking EKG paper and putting in new roll.	EKG	6
72	Loading X-ray film cassettes.	X-ray	9
		DRA	9
269	Deciding repair is needed for EKG machine.	EKG	2
		DRA	3
267	Routine cleaning and dusting of machines.	EKG	6
		DRA	6
223	Deciding to make an empty bed and making.	FHW	2
69	Using automatic developer for X-ray and spot films.	X-ray	9
		DRA	8
222	Duplicating forms on duplicating machine.	FHW	4
144	Preparing hot water sterilizer for use.	LPN-U	6
146	Setting autoclave.	LPN-U	6
		MA-U	6
273	Turning on X-ray film developing machine.	DRA	6

[a] Radiologist = RAD; Internist = INT; Obstetrician-Gynecologist = OB-GYN; Pediatrician = PED; Lead X-ray Tech. and X-ray Tech. = X-ray; Nurse Practitioner = NP; LPN-Unit = LPN-U; LPN-Emergency = LPN-E; Family Health Worker = FHW; Medical Assistant-Unit = MA-U; EKG Tech. = EKG; Dark Room Aide = DRA.

[b] Numbers refer to scale values of the Task Frequency Scale. (B.3).

The second set of tasks probably could be related to Factor Four, but more likely would cluster with tasks of performers in administrative titles.

The third set of tasks are related to the second but seem to deal more specifically with supplies and inventories. These tasks and those in the administrative group are placed in Figure 15 so that they can be seen to lie beside and lead to their comparable level counterparts in Factor Four.

The fourth set of tasks are all very low level tasks.involving little skill and practically no knowledge. These all deal with the use or care of materials and/or equipment or housekeeping activities. It is hard to say whether these tasks would lead to any other factor or simply are unskilled entry level duties which cannot be seen as stepping stones in and of themselves. On Figure 15 these tasks are placed near Factors Three, Five and Six, since they are most closely related to the more manual factors.

CHAPTER 4

TASK SEQUENCES, LATTICES AND CURRICULUM CONTENT

The HSMS task analysis data not only provide insights into the ways in which tasks activities relate to one another, they provide information on the educational content required for task sequences and lattices. This chapter first presents a conceptual discussion about the use of task data for curricula and then presents a detailed account of the curriculum content and lattice relationships for each of the task factors. The last section of the chapter deals with current educational locations for the task sequences as derived from the pilot test curriculum analysis described in Chapter 2.

TASK LADDERS AND LATTICES

Job ladders or task sequences refer to vertically promotional steps derived from the grouping of tasks which draw on rising levels of interrelated skills and knowledge. This assumes both the transferability and the additive nature of the skills and knowledge. The HSMS task data make it possible to pinpoint the skills and knowledge needed for every task factor and for each level within a factor. It is thus possible to delineate the necessary curriculum content for each level in a task sequence and also to identify the educational gap between levels. The difference between the highest achieved scale level for each skill and knowledge category at a particular sequence level and the highest necessary scale levels for skills and knowledge at the next sequence level, plus any new skills and knowledge needed at the next level defines the educational gap between levels.

Job lattices or task sequence lattices allow for linkages across ladders both horizontally and diagonally. Where there is transferability of skills and knowledge at a given level there can be cross-over options and a choice of promotional pathways. The principle involved is that the skills and knowledge used in a given task sequence level may serve as a basis for more than one specialty. A given specialty may build on more than one kind of prior preparation, and the entry to specific professional jobs could thus be reached in a lattice by more than one sequence. Conversely, a given sequence level can be a step towards more than one specialty.

The same type of analysis of task data can serve to identify the educational gap across sequences. In the HSMS data tasks which load high on more than one factor provide the clue for the most logical lattice possibilities. Later in this chapter the educational content of task sequences and lattices explored in the pilot test will be presented.

CURRICULUM CONTENT AND CURRICULUM DESIGN

This section is offered as a conceptual framework for the discussion of educational content to follow. It is presented to avoid the confusion between tasks and curriculum design on one hand, and between curriculum content identified through the HSMS task data and curriculum design on the other.

Tasks and Curriculum Design

There appears to be a tendency in the field of "para-professional" or "allied health occupations" training to confuse task perfor-

mance and curriculum design. A number of projects have attempted to design curricula for new occupations or to develop programs for existing occupations with a view towards making some upward mobility possible for health services employees. These projects collect task data to determine what activities the curricula would have to prepare the employees to do, but they then set about to design curricula which would teach students to perform the steps of the tasks, as the tasks are currently being done. That is, the curricula are designed to teach the actual procedures or steps of the tasks, and little more.

The design of curricula based solely on teaching how to do the steps of tasks is a corruption of the possible uses of task analysis in curriculum design. The focus on teaching task procedures makes the curriculum content (and the student) obsolete as soon as technology changes and/or the prccedures are changed. This leaves the performer with non-transferable knowledge.

The focus on teaching task procedures does not lay the foundation of skills and knowledge needed to build upon if upward mobility is to be achieved through efficient design of job and curriculum ladders. The objective of job and educational ladders should be to carry the individual potentially through all the steps in a ladder from entry level to professional levels, even though they provide exit points along the way.

The focus on teaching task procedures can leave the performer helpless to adapt to emergencies, since it does not permit the performer

to develop and exercise judgmental skills based on comprehension of subject matter. It thus defeats the need to develop flexibility about methods of task performance and about the quality of service to be provided to suit the needs of the situation.

The difference between dead-end jobs which are one or two steps up from the entry level and true career mobility lies in the educational experience. Historically, sub-professional workers have had training in skills, particularly manual skills, and in knowledge which was limited to the on-the-job learning of particular tasks. In contrast, the professional normally learns bodies of knowledge, abstract concepts and laws, or intellectual statements about how things function, why they function, and how these may vary under differing conditions.

The difference in learning which separates the on-the-job trained performer ("first you do this, and then you do that") from the performer trained in terms of organized knowledge ("you have to do certain kinds of things under certain kinds of circumstances") is that the first type of learning is not transferable, and the second is transferable. Transferability of learning means that an investment of time and effort in learning something is usable in more than one context; and this is the basis of mobility.

Task Data and Curriculum Design

While the HSMS method was designed to identify curriculum content beyond the statement of task procedures, it is equally important to differentiate the skill and knowledge data from curriculum design.

The skill and knowledge variables on which the tasks are rated are designed to reflect only attributes which can be treated as additive and which occur at varying levels. The skill and knowledge variables reflect only attributes which are obviously required for task performance. As a consequence, it would be impossible to assume that the task data can cover or provide for coverage of all the curriculum content required to train an individual for a given occupation. Non-transferable, non-additive and prerequisite contents are not covered by the skill and knowledge categories, and cannot be assumed to be covered in the List of Task Elements found on the Task Identification Summary Sheets.

In addition, the language of the knowledge scale,which refers to the depth and breadth of knowledge in the category,is broadly written. This does not substitute for the specific pinpointing of educational objectives and informational objectives in the design of curriculum.

The task statements and the skill and knowledge data can be used as inputs to curriculum design, as a type of checklist for curriculum content. While these data cannot, in and of themselves, be curricula, the task identification data and the skill and knowledge profiles can, however, act as reminders of what must be accounted for.

Very important is the fact that the specific knowledge categories appear at scaled levels in the tasks and task sequence levels. It can be very clear to the educator at what stage a particular subject area must be taught and at what level. In addition, by examining the

other tasks and sequence levels in a ladder or lattice, the educator can see what depth and breadth of comprehension will be required of the performer and can plan accordingly.

The educator can use the task data laid out in ladders or lattices to decide when to introduce specific information and subjects, how to introduce them, and how to tie the training to work. More important, in being able to show how the same knowledge or skill is used for more than one task, the educational effort itself can be enhanced, and the ability of the student to generalize and apply his training will be improved.

Job ladders building on the skills as well as on knowledge provide exit points along the way for practice, so that in the next learning sequence, as the individual rises, the prior learning is reinforced and added to. This presupposes that the educational methods will emphasize and amplify the additive nature of the learning and will not provide the training in discrete, disconnected units.

This brings into focus the relevance of teaching the skills directly and in connection with the knowledges to be applied. The intellectual skills, as any others, require practice. The teaching of these skills requires methods of education allowing for the practice of the skills in the process of acquiring knowledge.

THE CONTENT OF TASK SEQUENCES

While there appears to be a great deal of overlap of skill and knowledge requirements in health care, this overlap is more pronounced at the higher levels. And, while many categories are required by many tasks, no category is required by more than fifty percent of the 273 tasks.

The most frequently appearing knowledge category was Asepsis, required above zero in 105 of the tasks; it is followed by Regional Anatomy, required by 104 tasks. The skills are more widely required. There were 267 tasks with ratings above zero on the Consequences of Error to Humans scale.

The fact that higher level tasks require more knowledge categories is reflected in Figure 23. Factors Two and One, which begin at Level 4, require 175 and 158 knowledge categories respectively. However, there are differences among the factors which are independent of level or the number of tasks in the factor. Factor Five, with 90 tasks and represented at Level 6, requires a total of 118 categories compared with 175 for Factor Two or 127 for Factor Six. Factor Three requires the fewest knowledge categories (86).

In Appendix A, Tables A.4 through A.9 present all of the skill and knowledge categories required for each task factor and the number of tasks in that factor requiring each. Tables A.2 and A.3 presents comparable data for the pilot test as a whole.

Figure 23. TOTAL NUMBER OF SKILL AND KNOWLEDGE VARIABLES REQUIRED BY TASK FACTORS OR GROUPS

Factor or Groups	Total Variables Needed[a]		No. of Tasks
	Skills	Know. Cats.	
One: Surgery, Diagnosis and Prescription	14	158	15
Two: Pediatric Diagnosis and Prescription	14	175	11
Three: Machine Related Care and Radiology	15	86	26
Four: Social Service and Counseling	14	114	60
Five: Physical Care and Treatment	16	118	90
Six: Female Care	14	127	27
Unassigned:			
Laboratory Related	14	22	14
Administrative	11	2	9
Inventory and Supply Related	13	3	19
Machine Related and Housekeeping	11	1	18

[a] Required above zero on respective scale for any or all of tasks in factor or group.

It is noteworthy that the skills and knowledge categories needed most frequently are not always those which determine the factor. What determines the factor is the regular relationship among some variables. These tend to rise and fall together, but each may not be present at all levels or in all tasks.

The implications for curriculum from variables that determine factors is that they should be taught in relation to one another, since they are associated, and that they can usually be expected to be required in rising levels or at interrelated levels in their factor.

Factor Five[1]

Factor Five, the Physical Care and Treatment Factor, is represented at all levels except Level 7. The skills which are most frequent and which help determine the factor are Consequence of Error to Humans,

[1] The factors will not be discussed in numerical order. Factor Five is the most complete factor.

Object Manipulation and Figural Skills; the comparable knowledge categories are Asepsis, Regional Anatomy, Topographic Anatomy and Introductory Procedures.

Figure 24 is the first of a series of Figures which present the skill and knowledge content for task sequence levels. The specialty name of the factor is presented at the top. Each of the levels present in the factor is listed at the top of a column in ascending order from left to right. The skills and knowledges are presented in numerical order as they appear as requirements for a level. For example, there are 16 skills and knowledges required at Level 1, considering all the tasks of Level 1 in Factor Five. The scale value listed is the highest required among the tasks of the level. The scale level for each category or skill is then entered to the right for all the succeeding levels.

As can be seen from Figure 24, Object Manipulation is required at a scale value of 3.5 for Level 1. No additional training is needed to reach Level 2. To go from Level 2 to Level 3, the skill must be taught so that performance can reach a scale value of 7.5. After Level 3, the skill is continued to be needed at 7.5, and no additional specific training is needed.

Regional Anatomy is needed at 1.5 for Levels 1 and 2, rises to 3.5 at Level 3, to 5.5 at Level 4, and again to 7.0 at Level 5. No further education in Regional Anatomy is required to go from Level 5 to Level 6.

Figure 24. SKILL AND KNOWLEDGE REQUIREMENTS FOR TASK SEQUENCES: FACTOR FIVE
p. 1 of 4

Specialty Name: Physical Care and Treatment						
Sequence Level:[a]	1	2	3	4	5	6
Category Number and Name[b]	Highest Necessary Scale Values for Level[c]					
2 Object Manipulation*	3.5	3.5	7.5	7.5	7.5	7.5
3 Guiding or Steering	1.5	1.5	1.5			
4 Human Interaction	3.0	5.0	7.0	7.0	7.0	3.0
6 Oral Use of a Relevant Language	4.0	4.0	7.5	7.5	4.0	7.5
7 Reading Use of a Relevant Language	2.0	2.0	2.0	2.0	5.0	2.0
8 Written Use of a Relevant Language	2.0	2.0	2.0	5.0	2.0	5.0
9 Decision Making on Methods	1.5	3.0	4.5	4.5	7.0	7.0
10 Decision Making on Quality	3.5	7.0	7.0	7.0	7.0	9.0
15 Financial Consequences of Error	1.0	4.0	1.0	4.0	1.0	1.0
16 Consequences of Error To Humans*	5.5	8.0	8.0	9.0	9.0	9.0
11731100 Regional anatomy*	1.5	1.5	3.5	5.5	7.0	7.0
11733800 Disorders of the respiratory system	1.5	1.5	2.5	3.5	2.5	8.0
11734100 Disorders of skin,subcutaneous tiss.	1.5	1.5	1.5	5.5	5.5	
11737100 Bandages,dressings,tourns., splints.*	1.5	1.5	3.5	5.5	3.5	7.0
11738000 Asepsis	1.5	2.5	3.5	3.5	5.5	5.5
72000000 Cuisine (cooking and baking)	2.5					
11 Figural Skills*		1.0	3.5	3.5	5.0	3.5
12 Symbolic Skills		1.5	1.5	1.5	1.5	1.5
14 Implicative Skills		1.0	2.0	5.0	8.0	8.0
11731200 Topographic anatomy*		1.5	5.5	5.5	7.0	8.0
11731400 Circulatory system*		1.5	3.5	5.5	5.5	8.0
11731500 Respiratory system*		1.5	2.5	5.5	5.5	8.0
11731610 Mouth, pharynx, esophagus		1.5	1.5	5.5		
11731630 Large intestine (colon) and rectum		1.5			8.0	
11731831 Skin and sweat glands		1.5	1.5	5.5	5.5	5.5
11731943 Eye and optic nerve		1.5	3.5		2.5	

* Asterisk indicates variable determining factor.

[a] Tasks included in levels are as follows. See Table A.1 for task descriptions.
Level 1:217, 213, 166, 260, 180, 181, 153, 193, 183, 182, 214.
Level 2:179,229,152,185,210,215,206,163,224,173,244,199,93,200,201,162,142, 95,96,205,190,194,233,177,188,209,212,195,187,189,256,161,170,198.
Level 3:38,18,112,156,192,167,133,251,57,117,143,92,119,243,232,118,58,104, 109,218,191.
Level 4: 12, 17, 19, 34, 59, 33, 250, 13, 5, 105, 171.
Level 5: 50, 30, 32, 41, 61, 91, 31, 87.
Level 6: 28, 37, 60, 62, 22.

[b] For fuller descriptions of category names see Tables A.2 and A.3.

[c] For descriptions of scales see Chapter 2.

Figure 24. SKILL AND KNOWLEDGE REQUIREMENTS FOR TASK SEQUENCES: FACTOR FIVE (continued)
p. 2 of 4

Specialty Name: Physical Care and Treatment						
Sequence Level:[a]	1	2	3	4	5	6
Category Number and Name[b]	Highest Necessary Scale Values for Level[c]					
11731945 The ear (excluding balance function)		1.5	3.5		2.5	
11733000 Pathology		1.5	2.5	5.5	5.5	5.5
11733100 Infective and parasitic diseases		1.5		3.5	5.5	5.5
11733545 Disorders of the ear		1.5				
11733700 Disorders of the digestive system		1.5	1.5		2.5	5.5
11734600 Burns		1.5	2.5	3.5	3.5	8.0
11735400 Introductory procedures*		1.5	2.5	3.5	7.0	9.0
11737300 Handling,transportation of sick,wounded*		2.5	3.5	5.5	5.5	8.0
11737400 Sprains,strains,fractures;their healing		1.5	3.5	3.5	2.5	8.0
11737500 Foreign bodies not involving wounds		2.5	5.5	7.0	3.5	8.0
11737700 Wounds and their healing		1.5	3.5	5.5	5.5	8.0
11739430 Sanitation		1.5	1.5	2.5	2.5	2.5
11742132 Corrective,preventive,compensat.adjstmts.		1.5	1.5		3.5	2.5
11742143 Heat therapy		1.5				3.5
11743300 Nutritional qualities of foods		1.5	2.5		2.5	
11743400 Nutritional requirements and diets		2.5	2.5	1.5	3.5	3.5
12300000 Pharmacology		1.5	1.5	3.5	2.5	5.5
12331000 Drug toxicity		2.5	1.5	7.0	3.5	7.0
12332000 Drug idiosync.,allergy pharmacogenetics		2.5	1.5	7.0	3.5	7.0
12341100 Antibacterial and antifungal chemotherapy		2.5	2.5	3.5	3.5	5.5
12341200 Antiprotozoal/antimetazoal chemotherapy		1.5	1.5		2.5	3.5
12342100 Drugs act.on cardiovas.sys.,smooth muscle		1.5	2.5	3.5	2.5	8.0
12342200 Drugs acting on blood,immunologic system		1.5	2.5		2.5	5.5
12342300 Hormones,drugs actng. on endocr.glnds.etc.		1.5	2.5		3.5	5.5
12342600 Drgs. for allergy, cough, etc.		1.5	2.5	1.5	2.5	3.5
12342700 Drugs acting on gastrointestinal tract		1.5	2.5		2.5	3.5
12342800 Drugs acting on the nervous system		1.5	2.5		2.5	5.5
12342810 Drugs acting on autonomic nervous system		1.5	1.5		2.5	
12342820 Drugs acting on the neuromuscular system		1.5	1.5		2.5	5.5
12342830 Drugs acting on central nervous system		1.5	1.5		2.5	3.5
1 Locomotion			1.5			1.5
5 Leadership			1.0	1.0	3.0	4.5
11731000 Normal structure and function			2.5	5.5	7.0	8.0
11731600 Digestive system			2.5		5.5	7.0
11731700 Urinary system and external genitalia			2.5	3.5	8.0	5.5
11731810 Muscles			2.5	1.5	7.0	7.0
11731820 Bones and joints			2.5	1.5	8.0	8.0
11731900 Nervous system			1.5	2.5	5.5	7.0
11732210 Endocrine glands; their hormone physiology			2.5		2.5	
11732223 Female reproductive system			1.5	8.0	8.0	
11732400 Metabolism			1.5		5.5	5.5

Figure 24. SKILL AND KNOWLEDGE REQUIREMENTS FOR TASK SEQUENCES: FACTOR FIVE (continued)
p. 3 of 4

Specialty Name: Physical Care and Treatment						
Sequence Level:[a]	1	2	3	4	5	6
Category Number and Name[b]	Highest Necessary Scale Values for Level[c]					
11733300 Endocrine, nutritional, metabolic disorders			2.5		2.5	5.5
11733510 Disorders of the central nervous system			1.5	1.5	7.0	8.0
11733600 Disorders of the circulatory system			2.5	8.0	5.5	8.0
11733900 Disorders of the uro-genital system			2.5	8.0	7.0	
11734200 Disorders of musculoskel. syst., conn. tissues			2.5	1.5	5.5	5.5
11735600 Suture			1.5	3.5	5.5	5.5
11735700 Manipulation			2.5			5.5
11736000 Anesthesiology			1.5	3.5	3.5	3.5
11737200 Hemorrhage, bleeding; their arrest*			1.5	3.5	5.5	8.0
11737600 Resuscitation			1.5	8.0	2.5	8.0
11742110 Kinesiology and body mechanics			2.5			
11742133 Special post-disease, chronic disease therapy			1.5		3.5	
11742148 Exercise			2.5			
11745000 Growth and development			1.5	5.5	5.5	5.5
11745200 Neo-natal period*			2.5	2.5	7.0	7.0
65620000 Mechanics of writing English			3.5	3.5	3.5	3.5
13 Taxonomic Skills				2.0	5.5	5.5
11731930 Autonomic nervous system				2.5	5.5	5.5
11732222 Male reproductive system				1.5	2.5	
11733200 Neoplasms (cancerous growths)				5.5	5.5	
11733520 Disorders of the peripheral nervous system				1.5	5.5	5.5
11734300 Congenital abnormalities				1.5		
11734400 Disorders,complications of preg.,childbirth,puerp.				3.5	8.0	
11734500 Perinatal morbidity and mortality				2.5	9.0	
11734700 Poisoning				3.5	2.5	8.0
11734800 Shock and trauma				3.5	8.0	8.0
11735100 Operative procedures				3.5	3.5	
11737000 First aid and care				5.5	5.5	8.0
11745300 Infant growth*				5.5	7.0	7.0
11745400 Childhood growth				5.5	7.0	7.0
12200000 Radiology				5.5		
12220000 Radiographic (X-ray) analysis				3.5		5.5
12334000 Drug tolerance and physical dependence				2.5	2.5	3.5
12341400 Local chemotherapy				1.5		
14111000 Solutions				2.5		
15212100 Electric circuit theory				2.5		
24130000 Electronics				1.5		
11731300 Hematopoietic system					5.5	5.5
11731620 Stomach and small intestine					8.0	
11731910 Central nervous system					7.0	7.0
11731920 Peripheral nervous system					5.5	5.5

Figure 24. SKILL AND KNOWLEDGE REQUIREMENTS FOR TASK SEQUENCES: FACTOR FIVE (continued)
p. 4 of 4

Specialty Name: Physical Care and Treatment						
Sequence Level:[a]	1	2	3	4	5	6
Category Number and Name[b]	Highest Necessary Scale Values for Level[c]					
11732100 Immunologic system					2.5	3.5
11732220 Reproduction					8.0	
11732221 Conception and contraception					8.0	
11732300 Homeostasis of fluids					5.5	7.0
11733400 Disorders of blood and blood-forming organs					7.0	7.0
11735000 Surgery					3.5	3.5
11735800 Delivery methods for childbirth					2.5	
11741000 Epidemiology					3.5	
11743000 Nutrition and dietetics					2.5	5.5
11745100 Embryology and prenatal period					8.0	
11800000 Microbiology					1.5	
12333000 Drug resistance (of a non-genetic nature)					2.5	
12335000 Drug synergism					2.5	5.5
12342400 Vitamins and nutritional agents					3.5	3.5
41690000 Psychopathology					2.5	
41884200 Health services administration and policy					2.5	
11731832 Hair						3.5
11731833 Nails						3.5
11731941 Olfactory nerve and receptors						3.5
11733530 Disorders of the autonomic nervous system						8.0
11735500 Endoscopy						5.5
11742141 Hydrotherapy						3.5
11743100 Biochemistry of nutrients						5.5
11743200 Physiology of nutrients						5.5
12313000 Drug dose-response relationships						5.5
12321000 Drug absorption						3.5

* Asterisk indicates variable determining factor.

[a] Tasks included in levels are as follows. See Table A.1 for task descriptions.
Level 1:217, 213, 166, 260, 180, 181, 153, 193, 183, 182, 214.
Level 2:179,229,152,185,210,215,206,163,224,173,244,199,93,200,201,162,142, 95,96,205,190,194,233,177,188,209,212,195,187,189,256,161,170,198.
Level 3:38,18,112,156,192,167,133,251,57,117,143,92,119,243,232,118,58,104, 109,218,191.
Level 4: 12, 17, 19, 34, 59, 33, 250, 13, 5, 105, 171.
Level 5: 50, 30, 32, 41, 61, 91, 31, 87.
Level 6: 28, 37, 60, 62, 22.

[b] For fuller descriptions of category names see Tables A.2 and A.3.

[c] For descriptions of scales see Chapter 2.

As can also be seen from Figure 24, new skills and categories are needed to reach Level 2 from Level 1. These skills and categories are entered below the ones already presented. This process continues for each level, so that an indented progression appears. The educational gap between two levels is the additional scale values needed for skills and categories already introduced plus the new skills and categories needed at the new level.

The reader should note that sometimes a category required for one level is actually needed at a lower scale value for a higher level, and that some skills or categories are not needed at all. The Eye and Optic Nerve is needed at 3.5 for Level 3, not needed for Levels 4 and 6, and needed at 2.5 for Level 5. This information tells the curriculum designer that all the knowledge of The Eye and Optic Nerve ever to be used in this factor should be taught in the education for the rise from Level 2 to Level 3, and then need not be repeated or need only be reviewed. Similarly, Drug Toxicity is required at 3.5 for Level 5 and 7.0 at Level 6. However, since it was already needed at 7.0 for Level 4, there should be no need for new education.[2]

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[2] It might be noted that skills and knowledge variables which do not determine the factor are most likely to be needed in erratic movements from level to level. The interrelationships among variables that determine the factor is apparent on inspection of the names listed with asterisks in the various Figures.

The presentations of which Figure 24 is a prototype provide information on the scale values to be achieved at each level, and permit curriculum designers to plan so as to avoid redundancy. It should be noted that these data are guidelines only. There has not been sufficient review of the data to call them definitive.

Factor Four

Factor Four is the Social Service and Counseling Factor. It actually can be considered to exist at Levels 1, 2, 3b, 4 and 5. Levels 6 and 3a include the types of conference tasks which reflect the performer's other tasks.

As the factor exists it is a truncated version of what might be expected were additional functions to be studied. The tasks of this sequence probably should be combined with other sequences which already require emphasis on Human Interaction, Oral, Written and Reading Use of Language, Decision Making on Quality, Methods and Implicative Skills. As Figure 25 indicates, Levels 3a and 6 include a good deal of medical knowledge because the performers involved in the conference or Team tasks have jobs which require such knowledge.

Factor Six

Factor Six is the specialty in Female Care. It provides a lattice-type entry from other factors, since its tasks begin at Level 3. This factor combines the counseling of Factor Four with the physical

Figure 25. SKILL AND KNOWLEDGE REQUIREMENTS FOR TASK SEQUENCES: FACTOR FOUR
p. 1 of 4

Specialty Name: Social Service and Counseling						
Sequence Level:[a]	1	2	3b	3a	4	6
Category Number and Name[b]	Highest Necessary Scale Values for Level[c]					
2 Object Manipulation	3.5	3.5	5.0		1.5	
4 Human Interaction*	5.0	5.0	7.0	7.0	7.0	5.0
5 Leadership	1.0	4.5	4.5	1.0	1.0	
6 Oral Use of a Relevant Language*	4.0	7.5	7.5	4.0	7.5	7.5
7 Reading Use of a Relevant Language*	2.0	5.0	5.0	5.0	5.0	5.0
8 Written Use of a Relevant Language*	5.0	5.0	5.0	6.5	5.0	5.0
9 Decision Making on Methods*	4.5	7.0	4.5	4.5	7.0	4.5
10 Decision Making on Quality*	7.0	7.0	7.0	7.0	7.0	7.0
12 Symbolic Skills	1.5	1.5	1.5		1.5	
14 Implicative Skills*	2.0	5.0	5.0	5.0	5.0	9.0
15 Financial Consequences of Error	1.0	1.0	1.0	1.0	1.0	1.0
16 Consequences of Error to Humans	5.5	3.0	7.0	5.5	7.0	1.0
11731000 Normal structure and function	1.5	2.5	3.5	7.0	5.5	8.0
11731100 Regional anatomy	1.5	1.5	2.5		3.5	7.0
11731200 Topographic anatomy	1.5		1.5			
11731500 Respiratory system	1.5	1.5	1.5	5.5		8.0
11731831 Skin and sweat glands	1.5		1.5			
11733000 Pathology*	2.5	2.5	3.5	7.0	5.5	8.0
11733200 Neoplasms (cancerous growths)	1.5				3.5	7.0
11734100 Disord. of skin, subcutan. tissues	1.5			3.5	2.5	5.5
11737300 Handling,transport.of sick,wounded	2.5	2.5			3.5	
11737700 Wounds and their healing	1.5		1.5	5.5	2.5	5.5
11738000 Asepsis	1.5	1.5	2.5		5.5	
11739430 Sanitation	1.5	2.5	2.5	2.5	3.5	

* Asterisk indicates interrelated variable determining factor.

[a] Tasks included in levels are as follows. See Table A.1 for task descriptions:
Level 1: 234,259,107,116,138,247,204,211,254,215,126,113,216,106,225,208.
Level 2: 246,159,238,202,124,197,228,221,255,258,240,131,261,253,94,77.
Level 3b: 111,241,219,122,252,148,154,249,203,158,237,245,226,100.
Level 3a: 236, 26, 239, 127, 23.
Level 4: 90, 125, 121, 114, 101, 102, 115, 110.
Level 6: 25

[b] For fuller descriptions of category names see Tables A.2 and A.3.

[c] For descriptions of scales see Chapter 2.

Figure 25. SKILL AND KNOWLEDGE REQUIREMENTS FOR TASK SEQUENCES: FACTOR FOUR (continued)
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Specialty Name: Social Service and Counseling						
Sequence Level:[a]	1	2	3b	3a	4	6
Category Number and Name[b]	Highest Necessary Scale Values for Level[c]					
11742110 Kinesiology and body mechanics	1.5					
11742132 Correct.,prevent.,compens.adjustmts.	1.5		1.5		3.5	
11742133 Spec.post-disease,chronic,therapy	1.5		1.5	5.5	3.5	
11743300 Nutritional qualities of foods	1.5		3.5		5.5	
11743400 Nutritional requirements and diets	2.5	2.5	3.5	2.5	5.5	7.0
11745200 Neo-natal period	1.5					
41690000 Psychopathology*	1.5		2.5	3.5	3.5	3.5
65620000 Mechanics of writing English*	2.5	2.5	3.5	5.5	3.5	5.5
11 Figural Skills		1.0	1.0		1.0	
13 Taxonomic Skills		2.0	2.0	2.0	5.5	5.5
11731700 Urinary system, external genitalia		1.5	1.5		2.5	8.0
11732220 Reproduction		2.5	3.5	7.0	5.5	
11732221 Conception and contraception		5.5	3.5	2.5	5.5	
11732222 Male reproductive system		2.5	2.5	2.5	5.5	
11732223 Female reproductive system		3.5	3.5	2.5	5.5	
11733100 Infective and parasitic diseases		2.5	1.5	7.0	3.5	8.0
11733800 Disorders of respiratory system		2.5	1.5	3.5	3.5	8.0
11733900 Disorders of uro-genital system		2.5	1.5	3.5	3.5	7.0
11741000 Epidemiology		2.5		3.5	3.5	3.5
11742148 Exercise		1.5			3.5	
11744100 Oral hygiene and care		2.5			3.5	
12331000 Drug toxicity		1.5		1.5	2.5	
12332000 Drug idiosync.;allergy pharmacogenetics		1.5			2.5	
12342300 Hormones,drugs act.on endocr.glands,etc.		1.5	1.5		2.5	
41884200 Health services administration, policy*		1.5	3.5	5.5	3.5	3.5
72000000 Cuisine (cooking and baking)		2.5	2.5			
11731400 Circulatory system			1.5	5.5		8.0
11731600 Digestive system			1.5			8.0
11731810 Muscles			2.5			
11731820 Bones and joints			2.5			
11731900 Nervous system			3.5		1.5	8.0
11733510 Disorders of the central nervous system			2.5		3.5	
11733520 Disorders of the peripheral nervous system			2.5			
11733530 Disorders of the autonomic nervous system			2.5			
11733600 Disorders of the circulatory system			1.5	3.5	5.5	8.0
11733700 Disorders of the digestive system			1.5	3.5	3.5	8.0
11734300 Congenital abnormalities			1.5	2.5		
11735400 Introductory procedures			1.5		3.5	7.0
11737000 First aid and care			3.5	3.5	5.5	
11743000 Nutrition and dietetics			1.5		3.5	5.5
11745000 Growth and development			3.5	5.5	5.5	5.5

Figure 25. SKILL AND KNOWLEDGE REQUIREMENTS FOR TASK SEQUENCES: FACTOR FOUR (continued)
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Specialty Name: Social Service and Counseling							
Sequence Level:[a]		1	2	3b	3a	4	6
Category Number and Name[b]		Highest Necessary Scale Values for Level[c]					
11745100	Embryology and prenatal period			1.5		2.5	
11745300	Infant growth			3.5			
11745400	Childhood growth			3.5			
11745500	Adolescent growth			1.5		2.5	
11745700	Old age (geriatrics)			2.5		2.5	
12300000	Pharmacology			2.5	5.5	2.5	7.0
12341400	Local chemotherapy			1.5			
12342100	Drugs act.on cardiovas.syst.,smooth muscle			1.5			
41521200	Infant, preschool intelligence; measurement			2.5			
41522000	Differential abilities,aptitudes,measurement			2.5			
41610000	Sensation and perception			1.5			
41660000	Developmt.,growth of behav.processes of indiv.			3.5		3.5	
41666100	Infant behavioral development			2.5			
41666200	Childhood behavioral development			2.5			
41691000	Mental retardation			2.5			
41692000	Organic brain syndrome			2.5			
41710000	Psychotherapy and counseling*			1.5		3.5	
41884000	Social service administration and policy*			2.5	3.5	3.5	3.5
41884100	Soc.serv.for poor,indigent,admin.,policy			1.5	2.5	2.5	
41884300	Educational, training serv.admin.,policy			1.5	1.5	2.5	
41884400	Employment services administration,policy			1.5	1.5	2.5	
41884500	Legal services administration and policy			1.5	1.5	2.5	
41884600	Child care services administration,policy			1.5	2.5	2.5	
41884700	Recreational services admin., policy			1.5	1.5	2.5	
41884800	Spec.services for aged,infirm admin.,policy			2.5	2.5	2.5	
41884900	Consumer protection services admin.,policy			2.5	1.5	2.5	
41885100	Soc. agencies (pub.,priv.) admin., policy*			3.5	2.5	3.5	
43700000	Consumer economics			1.5		2.5	
11733300	Endocrine, nutritional, metabolic disorders				3.5	3.5	7.0
11733400	Disorders of blood, blood-forming organs				2.5	3.5	
11734200	Disorders of musculoskeletal syst.,conn.tissues				2.5	2.5	7.0
11734400	Disorders,complic.of pregnancy,childbirth,puerp.				5.5		
11734600	Burns				3.5		
11734700	Poisoning				3.5		
11735000	Surgery				3.5		5.5
11737400	Sprains,strains,fractures; their healing				5.5		
11739000	Community health and preventive medicine				5.5	2.5	3.5
11742100	Physical therapy				3.5	2.5	5.5
12334000	Drug tolerance and physical dependence				1.5	2.5	
12342810	Drugs acting on the autonomic nervous system				1.5	1.5	
12342830	Drugs acting on the central nervous system				1.5	1.5	
41695200	Disorders involving addictive behavior				2.5		

Figure 25. SKILL AND KNOWLEDGE REQUIREMENTS FOR TASK SEQUENCES: FACTOR FOUR (continued)
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Specialty Name: Social Service and Counseling						
Sequence Level:[a]	1	2	3b	3a	4	6
Category Number and Name[b]	Highest Necessary Scale Values for Level[c]					
11732210 Endocrine glands; their hormone physiology					1.5	5.5
11733543 Disorders of the eye and optic nerve					2.5	
11735100 Operative procedures					1.5	
11739100 Treatment of social causes of illness					1.5	
11739300 Rehabilitation, restoration of indiv. to community					1.5	
11745600 Adulthood					2.5	
12335000 Drug synergism					2.5	
12341100 Antibacterial and antifungal chemotherapy					1.5	
12341200 Antiprotozoal/antimetazoal chemotherapy					1.5	
12342800 Drugs acting on the nervous system					2.5	
12342820 Drugs acting on the neuromuscular system					1.5	
41642000 Sex drives					2.5	
41693000 Psychoses					2.5	
41720000 Organic therapy					1.5	
11200000 Genetics						3.5
11732100 Immunologic system						5.5
11736000 Anesthesiology						3.5
11800000 Microbiology						3.5
12200000 Radiology						5.5
12210000 Radiobiology						3.5
12220000 Radiographic (X-ray) analysis						5.5

* Asterisk indicates interrelated variable determining factor.

[a] Tasks included in levels are as follows. See Table A.1 for task descriptions:
Level 1: 234,259,107,116,138,247,204,211,254,215,126,113,216,106,225,208.
Level 2: 246,159,238,202,124,197,228,221,255,258,240,131,261,253,94,77.
Level 3b: 111,241,219,122,252,148,154,249,203,158,237,245,226,100.
Level 3a: 236, 26, 239, 127, 23.
Level 4: 90, 125, 121, 114, 101, 102, 115, 110.
Level 6: 25

[b] For fuller descriptions of category names see Tables A.2 and A.3.

[c] For descriptions of scales see Chapter 2.

care of Factor Five. At Level 5, the nature of the tasks suggest a possible entry into Factor Two through Level 4. There are five knowledge categories which both determine the factor and also are present in at least 50 percent of the Factor Six tasks. These are Reproduction, Female Reproductive System, Urinary System and External Genetalia, Disorders of the Uro-genital System, and Infective and Parasitic Diseases.

The interrelationship between this factor and Factors Four and Five indicate the possible benefits of this specialty -- as separate from the traditional Obs-Gyn specialty. That is, that the counseling and educational aspects of sex, conception, contraception, pregnancy, childbirth, physical female disorders and venereal diseases could be more emphasized than is the usual experience with the Obstetrician-Gynecologist, while the medical and physiological aspects of the specialty would redress the absence of adequate training in these areas for the usual counselor in these subjects.

Figure 26 presents the content of the various levels for Factor Six. Most of these present orderly, rising requirements from level to level, with substantial additions of categories between each level.

Factor Three

Factor Three has the interesting characteristic that some of the levels of the task sequences are probably missing. The gap between the X-ray tasks at Level 3 and the fluoroscopy tasks at Level 5, with the latter requiring much diagnostic knowledge, is extremely great. In

Figure 26. SKILL AND KNOWLEDGE REQUIREMENTS FOR TASK SEQUENCES: FACTOR SIX
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Specialty Name: Female Care				
Sequence Level:[a]	3	4	5	6
Category Number and Name[b]	Highest Necessary Scale Values for Level[c]			
2 Object Manipulation	5.0	5.0	7.5	7.5
4 Human Interaction	7.0	7.0	7.0	7.0
5 Leadership	1.0	1.0	3.0	6.5
6 Oral Use of a Relevant Language	7.5	7.5	7.5	7.5
7 Reading Use of a Relevant Language	2.0	2.0	5.0	5.0
8 Written Use of a Relevant Language	5.0	2.0	5.0	5.0
9 Decision Making on Methods	3.0	7.0	4.5	4.5
10 Decision Making on Quality	7.0	7.0	7.0	7.0
11 Figural Skills	1.0	3.5	5.0	5.0
12 Symbolic Skills	1.5	1.5	1.5	1.5
13 Taxonomic Skills	2.0	2.0	5.5	5.5
14 Implicative Skills	5.0	5.0	8.0	8.0
15 Financial Consequences of Error	1.0	1.0	1.0	1.0
16 Consequences of Error To Humans	7.0	8.0	9.0	9.0
11731000 Normal structure and function	2.5	5.5	7.0	8.0
11731100 Regional anatomy	2.5	5.5	7.0	8.0
11731200 Topographic anatomy	1.5	3.5	7.0	8.0
11731400 Circulatory system	1.5	1.5	5.5	8.0
11731500 Respiratory system	1.5	1.5	5.5	8.0
11731600 Digestive system	1.5	1.5	5.5	8.0
11731700 Urinary system and external genitalia*	2.5	3.5	8.0	9.0
11731831 Skin and sweat glands	1.5	2.5	5.5	5.5
11732220 Reproduction*	3.5	5.5	8.0	9.0
11732221 Conception and contraception*	3.5	5.5	8.0	9.0
11732222 Male reproductive system*	1.5	5.5	3.5	8.0
11732223 Female reproductive system*	3.5	8.0	8.0	9.0
11733000 Pathology	2.5	5.5	5.5	8.0
11733100 Infective and parasitic diseases*	1.5	3.5	5.5	8.0

* Asterisk indicates variable determining factor.

[a] Tasks included in levels are as follows. See Table A.1 for task descriptions.
Level 3: 258, 249, 103, 51, 16, 143, 15, 117, 118, 107.
Level 4: 248, 101, 84, 5, 11, 202, 226, 250.
Level 5: 86, 85, 89, 50, 41.
Level 6: 54, 52, 43, 42.

[b] For fuller descriptions of category names see Tables A.2 and A.3.

[c] For descriptions of scales see Chapter 2.

Figure 26. SKILL AND KNOWLEDGE REQUIREMENTS FOR TASK SEQUENCES: FACTOR SIX (continued)
p. 2 of 4

Specialty Name: Female Care				
Sequence Level:[a]	3	4	5	6
Category Number and Name[b]	Highest Necessary Scale Values for Level[c]			
11733200 Neoplasms (cancerous growths)	1.5	5.5	5.5	8.0
11733600 Disorders of the circulatory system	1.5	1.5	5.5	8.0
11733700 Disorders of the digestive system	1.5	1.5	5.5	8.0
11733800 Disorders of the respiratory system	1.5	2.5	3.5	8.0
11733900 Disorders of the uro-genital system*	2.5	8.0	7.0	8.0
11734100 Disorders of skin and subcutaneous tissues	1.5	3.5	5.5	5.5
11735400 Introductory procedures	2.5	5.5	5.5	8.0
11737700 Wounds and their healing	1.5	2.5	5.5	8.0
11738000 Asepsis	3.5	3.5	5.5	5.5
11800000 Microbiology*	3.5	1.5	1.5	5.5
12342300 Hormones, drugs acting on endocr. glands,etc.	1.5	2.5	2.5	8.0
14128000 Separation methods in analysis	1.5			
65620000 Mechanics of writing English	2.5	5.5	3.5	5.5
11731810 Muscles		1.5	7.0	8.0
11731820 Bones and joints		1.5	3.5	5.5
11731900 Nervous system		1.5	5.5	5.5
11732210 Endocrine glands; their hormone physiology*		1.5	3.5	8.0
11733300 Endocrine, nutritional, metabolic disorders*		1.5	3.5	8.0
11733510 Disorders of the central nervous system		1.5	3.5	5.5
11733520 Disorders of the peripheral nervous system		1.5	3.5	5.5
11734200 Disorders of musculoskel. syst., conn. tissues		1.5	3.5	3.5
11734300 Congenital abnormalities*		1.5	5.5	9.0
11734400 Disorders, complic. of pregnancy, birth, puerp.*		2.5	8.0	9.0
11734500 Perinatal morbidity and mortality*		1.5	9.0	9.0
11735100 Operative procedures*		1.5	3.5	8.0
11735800 Delivery methods for childbirth*		1.5	5.5	9.0
11737300 Handling, transp. of the sick or wounded		2.5	5.5	
11739100 Treatment of social causes of illness		1.5		
11741000 Epidemiology*		3.5	2.5	5.5
11743400 Nutritional requirements and diets		2.5	5.5	8.0
11745000 Growth and development		5.5	5.5	7.0
11745100 Embryology and prenatal period*		2.5	8.0	9.0
11745200 Neo-natal period		2.5	5.5	5.5
11745500 Adolescent growth		2.5		8.0
11745600 Adulthood		2.5	3.5	8.0
11745700 Old age (geriatrics)		2.5		
12200000 Radiology		5.5		5.5
12300000 Pharmacology		2.5	2.5	7.0
12332000 Drug idiosyncrasy; allergy pharmacogenetics		1.5	2.5	7.0
12341100 Antibacterial and antifungal chemotherapy		1.5	2.5	7.0
12341200 Antiprotozoal/antimetazoal chemotherapy		1.5		7.0

Figure 26. SKILL AND KNOWLEDGE REQUIREMENTS FOR TASK SEQUENCES: FACTOR SIX (continued)
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Specialty Name: Female Care					
Sequence Level:[a]		3	4	5	6
Category Number and Name[b]		Highest Necessary Scale Values for Level[c]			
14111000	Solutions		2.5		
41642000	Sex drives		2.5		5.5
41660000	Development, growth of behav.processes of indiv.		2.5	2.5	
41690000	Psychopathology		2.5	2.5	3.5
41710000	Psychotherapy and counseling		2.5	2.5	2.5
41884000	Social service administration and policy		2.5		
41884200	Health services administration and policy		1.5	2.5	3.5
41885100	Social agencies (pub.,priv.) admin.,policy		1.5		
11731300	Hematopoietic system			3.5	5.5
11731620	Stomach and small intestine			8.0	8.0
11731630	Large intestine (colon) and rectum			8.0	8.0
11731910	Central nervous system (brain and spinal cord)			3.5	5.5
11731920	Peripheral nervous system			3.5	5.5
11731930	Autonomic nervous system			3.5	7.0
11731943	Eye and optic nerve			3.5	3.5
11731945	The ear (excluding balance function)			2.5	3.5
11732100	Immunologic system			2.5	8.0
11732300	Homeostasis of fluids			5.5	7.0
11732400	Metabolism			5.5	8.0
11733400	Disorders of blood and blood-forming organs			3.5	
11733530	Disorders of the autonomic nervous system			3.5	5.5
11733543	Disorders of the eye and optic nerve			3.5	
11733545	Disorders of the ear			3.5	
11734800	Shock and trauma			8.0	8.0
11735000	Surgery			3.5	8.0
11735600	Suture			1.5	8.0
11736000	Anesthesiology			3.5	8.0
11737000	First aid and care			5.5	7.0
11737100	Bandages, dressings, tourniquets, splints			3.5	5.5
11737200	Hemorrhage and bleeding and their arrest			3.5	8.0
11739430	Sanitation			2.5	
11742132	Corrective, preventive, compens. adjustments			3.5	
11742148	Exercise			2.5	3.5
11743000	Nutrition and dietetics			3.5	5.5
11743300	Nutritional qualities of foods			3.5	
11744100	Oral hygiene and care			2.5	
11745300	Infant growth			3.5	
12331000	Drug toxicity			2.5	7.0
12334000	Drug tolerance and physical dependence			2.5	5.5
12336000	Chemical teratogenesis			3.5	5.5
12342100	Drugs acting on cardiovas. syst., smooth muscle			3.5	8.0

Figure 26. SKILL AND KNOWLEDGE REQUIREMENTS FOR TASK SEQUENCES: FACTOR SIX (continued)
p. 4 of 4

Specialty Name: Female Care				
Sequence Level:[a]	3	4	5	6
Category Number and Name[b]	Highest Necessary Scale Values for Level[c]			
12342200 Drugs acting on the blood, immunologic syst.			2.5	8.0
12342400 Vitamins and nutritional agents			2.5	5.5
12342600 Drugs for allergy,cough,vomiting,derm-muc.surfaces			2.5	5.5
12342700 Drugs acting on the gastrointestinal tract			2.5	5.5
12342800 Drugs acting on the nervous system			2.5	5.5
41666100 Infant behavioral development			3.5	
41691000 Mental retardation			2.5	
41884100 Social services for poor, indig., admin.,policy			2.5	
11200000 Genetics*				5.5
11731610 Mouth, pharynx, esophagus				5.5
11731640 Liver, biliary system, and pancreas				5.5
11735300 Repair surgery				8.0
11735500 Endoscopy				5.5
11735700 Manipulation				5.5
11737600 Resuscitation				8.0
11739000 Community health and preventive medicine				5.5
11743100 Biochemistry of nutrients				5.5
11743200 Physiology of nutrients				5.5
12100000 Cell biology				5.5
12110000 Cell morphology				8.0
12210000 Radiobiology				3.5
12220000 Radiographic (X-ray) analysis				5.5
12313000 Drug dose-response relationships				5.5
12321000 Drug absorption				5.5
12322000 Drug distribution				5.5
12323000 Drug excretion				5.5
12333000 Drug resistance (of a non-genetic nature)				5.5
12335000 Drug synergism				5.5
13900000 Biochemical processes and mechanisms				5.5
41650000 Emotions				3.5
41696000 Psychosomatic disorders				3.5

* Asterisk indicates variable determining factor.

[a] Tasks included in levels are as follows. See Table A.1 for task descriptions.
Level 3: 258, 249, 103, 51, 16, 143, 15, 117, 118, 107.
Level 4: 248, 101, 84, 5, 11, 202, 226, 250.
Level 5: 86, 85, 89, 50, 41.
Level 6: 54, 52, 43, 42.

[b] For fuller descriptions of category names see Tables A.2 and A.3.

[c] For descriptions of scales see Chapter 2.

addition, the more specialized work of the Radiologist that might be reflected at Level 7 is missing. The tasks which would warrant being at Levels 4 or 7 are probably present in the hospital setting.

All of the variables which determine Factor Three are required by 30 percent or more of the tasks of Factor Three. No knowledge categories are required at Level 1. Figural Skills link the tasks at Levels 1 and 2 with Level 3. As Figure 27 indicates, Normal Structure and Function, Topographic Anatomy, Pathology, and Handling and Transportation of the Sick and Wounded link Level 2 (EKG and Eye Testing) with Level 3.

Factor Two

Factor Two, the Pediatric Diagnosis and Prescription specialty, includes examination and assessment tasks for the adult as well as the juvenile at Level 4, but excludes the neonate examination which appears in Factor Six. This is due to differences in knowledge requirements for the tasks.

This factor requires the largest number of knowledge categories and contains the fewest tasks. There are 33 categories which are needed for every task of the eleven represented in the Factor. The magnitude of the rise from the level of Nurse Practitioner (Level 4) to Pediatrician can be understood when it is considered that Level 5 is primarily a teaching level, and Level 6 includes the true pediatric diagnostics. Figure 28 indicates the enormous rise in scale values as well as increase in categories between Levels 4 and 6. This will also explain the educational distance between most other factors and Factor Two.

Figure 27. SKILL AND KNOWLEDGE REQUIREMENTS FOR TASK SEQUENCES: FACTOR THREE
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Specialty Name: Machine Related Care and Radiology					
Sequence Level:[a]	1	2	3	5	6
Category Number and Name[b]	Highest Necessary Scale Values for Level[c]				
2 Object Manipulation	3.5	3.5	3.5	3.5	1.5
9 Decision Making on Methods	1.5	3.0	4.5	7.0	9.0
10 Decision Making on Quality	3.5	7.0	7.0	9.0	9.0
11 Figural Skills*	1.0	1.0	5.0	5.0	7.0
15 Financial Consequences of Error	1.0	1.0	1.0	1.0	1.0
16 Consequences of Error To Humans	1.0	1.0	5.5	7.0	9.0
4 Human Interaction	1.0	5.0	5.0	7.0	3.0
6 Oral Use of a Relevant Language	2.0	4.0	4.0	7.5	7.5
7 Reading Use of a Relevant Language	2.0	2.0	2.0	5.0	5.0
8 Written Use of a Relevant Language	2.0	2.0	2.0	6.5	6.5
12 Symbolic Skills		1.5	1.5	1.5	1.5
14 Implicative Skills		2.0	2.0	8.0	9.0
11731000 Normal structure and function		2.5	2.5	7.0	8.0
11731200 Topographic anatomy*		1.5	3.5	8.0	8.0
11733000 Pathology		1.5	1.5	7.0	8.0
11733543 Disorders of the eye and optic nerve		1.5		3.5	3.5
11733600 Disorders of the circulatory system		1.5		5.5	7.0
11737300 Handling and transport of sick, wounded		2.5	2.5	5.5	
12200000 Radiology*		2.5	2.5	8.0	8.0
12220000 Radiographic (X-ray) analysis*		3.5	3.5	8.0	9.0
65620000 Mechanics of writing English		1.5		3.5	5.5
3 Guiding or Steering			1.5		
5 Leadership			4.5	4.5	
11731100 Regional anatomy			3.5	7.0	8.0
11731600 Digestive system			2.5	8.0	8.0
11731620 Stomach and small intestine			2.5	8.0	8.0
11731630 Large intestine (colon) and rectum			2.5	8.0	8.0
11731700 Urinary system and external genitalia			2.5	7.0	8.0

* Asterisk indicates interrelated variable determining factor.

[a] Tasks included in levels are as follows. See Table A.1 for task descriptions.
Level 1: 71, 78, 263, 272.
Level 2: 73, 74, 262, 270, 257, 99, 82, 79, 132, 271.
Level 3: 68, 67, 65, 66, 81.
Level 5: 1, 3, 4, 7, 20.
Level 6: 6, 8.

[b] For fuller descriptions of category names see Tables A.2 and A.3.

[c] For descriptions of scales see Chapter 2.

Figure 27. SKILL AND KNOWLEDGE REQUIREMENTS FOR TASK SEQUENCES: FACTOR THREE (continued)
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Specialty Name: Machine Related Care and Radiology					
Sequence Level:[a]	1	2	3	5	6
Category Number and Name[b]	Highest Necessary Scale Values for Level[c]				
11735400 Introductory procedures			1.5	5.5	3.5
11738000 Asepsis			1.5		
12210000 Radiobiology*			1.5	5.5	5.5
12332000 Drug idiosyn., allergy pharmacogenetics			1.5		3.5
15212100 Electric circuit theory*			2.5	5.5	
15214200 Optics*			2.5	5.5	3.5
15315000 Optical properties*			1.5	5.5	3.5
13 Taxonomic Skills*				5.5	9.0
11731300 Hematopoietic system				5.5	7.0
11731400 Circulatory system				5.5	8.0
11731500 Respiratory system				7.0	8.0
11731610 Mouth, pharynx (dig. funct.), esophagus				7.0	8.0
11731640 Liver, biliary system, and pancreas				8.0	8.0
11731820 Bones and joints				7.0	8.0
11731943 Eye and optic nerve				5.5	3.5
11731945 The ear (excluding balance function)				3.5	3.5
11732220 Reproduction				5.5	5.5
11732223 Female reproductive system				8.0	8.0
11733100 Infective and parasitic diseases				5.5	7.0
11733200 Neoplasms (cancerous growths)				5.5	7.0
11733300 Endocrine, nutrit., metabolic disorders				5.5	7.0
11733400 Disord. of blood, blood-forming organs				5.5	7.0
11733700 Disorders of the digestive system				8.0	7.0
11733800 Disorders of the respiratory system				5.5	7.0
11733900 Disorders of the uro-genital system				8.0	7.0
11734200 Dis. of musculoskel. sys., conn. tissue				5.5	8.0
11734300 Congenital abnormalities				3.5	7.0
11735000 Surgery				3.5	5.5
11737000 First aid and care				8.0	
11737400 Sprains, strains, fractures; their healing				5.5	8.0
11737500 Foreign bodies not involving wounds				3.5	5.5
11742131 Amputation adjustments				3.5	2.5
11742132 Corrective, prevent. and comp. adjust.				3.5	3.5
11745000 Growth and development				5.5	7.0
12342300 Horm.,drugs on endo.glnds,acc.repro.org.				5.5	5.5
12342700 Drugs acting on gastrointestinal tract				3.5	5.5
14111000 Solutions				2.5	
11200000 Genetics					2.5
11731831 Skin and sweat glands					5.5
11731900 Nervous system					7.0
11731941 Olfactory nerve and receptors					3.5

Figure 27. SKILL AND KNOWLEDGE REQUIREMENTS FOR TASK SEQUENCES: FACTOR THREE (continued)
p. 3 of 3

Specialty Name: Machine Related Care and Radiology					
Sequence Level:[a]	1	2	3	5	6
Category Number and Name[b]	Highest Necessary Scale Values for Level[c]				
11732210 Endocrine glands and hormone physiology					7.0
11732221 Conception and contraception					5.5
11732222 Male reproductive system					5.5
11733510 Disorders of the central nervous system					7.0
11733520 Disorders of the peripheral nervous system					7.0
11733530 Disorders of the autonomic nervous system					7.0
11733541 Disorders of olfactory nerve, receptors					3.5
11733545 Disorders of the ear					3.5
11734100 Disord. of skin, subcutaneous tissues					5.5
11734400 Disord.,complic.pregnancy, birth, puerp.					7.0
11734600 Burns					5.5
11734700 Poisoning					7.0
11734800 Shock and trauma					2.5
11735100 Operative procedures					5.5
11735200 Amputation and disarticulation					5.5
11735300 Repair surgery					5.5
11735500 Endoscopy					5.5
11735700 Manipulation					5.5
11742100 Physical therapy					3.5
11742110 Kinesiology and body mechanics					3.5
11742120 Disability evaluation					3.5
11744200 Oral surgery					2.5
11800000 Microbiology					3.5
12100000 Cell biology					3.5
12230000 Radioisotope scanning					5.5
12300000 Pharmacology					5.5
12321000 Drug absorption					3.5
12322000 Drug distribution					5.5
12331000 Drug toxicity					3.5
12336000 Chemical teratogenesis					5.5
12338000 Chemical carcinogenesis					5.5
12342100 Drugs act.on cardiovas.sys.,smooth mus.					5.5

* Asterisk indicates interrelated variable determining factor.

[a] Tasks included in levels are as follows. See Table A.1 for task descriptions.
Level 1: 71, 78, 263, 272.
Level 2: 73, 74, 262, 270, 257, 99, 82, 79, 132, 271.
Level 3: 68, 67, 65, 66, 81.
Level 5: 1, 3, 4, 7, 20.
Level 6: 6, 8.

[b] For fuller descriptions of category names see Tables A.2 and A.3.

[c] For descriptions of scales see Chapter 2.

Figure 28. SKILL AND KNOWLEDGE REQUIREMENTS FOR TASK SEQUENCES: FACTOR TWO
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Specialty Name: Pediatric Diagnosis and Prescription			
Sequence Level:[a]	4	5	6
Category Number and Name[b]	Highest Necessary Scale Values for Level[c]		
2 Object Manipulation	5.0	5.0	7.5
4 Human Interaction	5.0	7.0	7.0
5 Leadership	3.0	4.5	6.5
6 Oral Use of a Relevant Language	7.5	7.5	7.5
7 Reading Use of a Relevant Language	5.0	7.0	7.0
8 Written Use of a Relevant Language	5.0	5.0	9.0
9 Decision Making on Methods	4.5	7.0	7.0
10 Decision Making on Quality	7.0	7.0	9.0
11 Figural Skills	1.0	1.0	3.5
12 Symbolic Skills	1.5	1.5	1.5
13 Taxonomic Skills	5.5	5.5	7.0
14 Implicative Skills	5.0	5.0	9.0
15 Financial Consequences of Error	1.0	1.0	1.0
16 Consequences of Error To Humans	5.5	5.5	9.0
11731000 Normal structure and function	7.0	7.0	9.0
11731100 Regional anatomy	3.5	5.5	9.0
11731200 Topographic anatomy	3.5	5.5	9.0
11731300 Hematopoietic system*	5.5	3.5	8.0
11731400 Circulatory system	7.0	5.5	8.0
11731500 Respiratory system	7.0	5.5	8.0
11731600 Digestive system	7.0	5.5	8.0
11731700 Urinary system and external genitalia	7.0	5.5	8.0
11731810 Muscles	5.5	5.5	8.0
11731820 Bones and joints	5.5	5.5	8.0
11731831 Skin and sweat glands	5.5	5.5	8.0
11731832 Hair	2.5	3.5	7.0
11731833 Nails	2.5	3.5	7.0
11731900 Nervous system	5.5	5.5	8.0
11731943 Eye and optic nerve*	2.5	5.5	7.0

* Asterisk indicates variable determining factor.

[a] Tasks included in levels are as follows. See Table A.1 for task descriptions.
Level 4: 88, 83, 24.
Level 5: 29, 123, 120.
Level 6: 55, 63, 64, 56, 27.

[b] For fuller descriptions of category names see Tables A.2 and A.3.

[c] For descriptions of scales see Chapter 2.

Figure 28. SKILL AND KNOWLEDGE REQUIREMENTS FOR TASK SEQUENCES: FACTOR TWO (continued)
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Specialty Name: Pediatric Diagnosis and Prescription				
Sequence Level:[a]		4	5	6
Category Number and Name[b]		Highest Necessary Scale Values for Level[c]		
11731945	The ear (excluding balance function)*	2.5	5.5	7.0
11732100	Immunologic system*	5.5	5.5	8.0
11732210	Endocrine glands, their hormone physiology	5.5	5.5	8.0
11732220	Reproduction	5.5	5.5	8.0
11732222	Male reproductive system*	3.5	5.5	7.0
11732223	Female reproductive system	3.5	5.5	8.0
11732400	Metabolism	5.5	3.5	8.0
11733000	Pathology	7.0	7.0	8.0
11733100	Infective and parasitic diseases	7.0	7.0	8.0
11733200	Neoplasms (cancerous growths)	5.5	3.5	8.0
11733300	Endocrine, nutritional, metabolic disorders	5.5	5.5	8.0
11733400	Disorders of blood and blood-forming organs*	5.5	5.5	7.0
11733510	Disorders of the central nervous system	5.5	5.5	8.0
11733520	Disorders of the peripheral nervous system*	5.5	5.5	7.0
11733530	Disorders of the autonomic nervous system	5.5	5.5	7.0
11733543	Disorders of the eye and optic nerve*	5.5	3.5	7.0
11733545	Disorders of the ear*	2.5	3.5	7.0
11733600	Disorders of the circulatory system	7.0	5.5	8.0
11733700	Disorders of the digestive system*	7.0	5.5	8.0
11733800	Disorders of the respiratory system	5.5	5.5	8.0
11733900	Disorders of the uro-genital system	5.5	5.5	8.0
11734100	Disorders of the skin and subcutaneous tissues	5.5	5.5	7.0
11734200	Disorders of musculoskel.syst.,conn.tissues*	5.5	5.5	7.0
11734300	Congenital abnormalities*	3.5	3.5	8.0
11734400	Disorders, complications of preg.,birth,puerp.	5.5	5.5	7.0
11734600	Burns*	5.5	5.5	7.0
11734700	Poisoning*	5.5	5.5	8.0
11734800	Shock and trauma	3.5	5.5	8.0
11735000	Surgery	5.5		5.5
11737000	First aid and care	3.5	7.0	8.0
11737200	Hemorrhage and bleeding and their arrest	3.5	5.5	8.0
11737300	Handling, transportation of sick, wounded*	3.5	5.5	8.0
11737400	Sprains, strains, fractures and their healing*	5.5	5.5	8.0
11737700	Wounds and their healing	5.5	5.5	8.0
11738000	Asepsis	3.5	5.5	7.0
11739430	Sanitation*	2.5	3.5	5.5
11741000	Epidemiology*	3.5	3.5	5.5
11742100	Physical therapy*	3.5	3.5	5.5
11742132	Corrective, preventive, compensatory adjustments*	2.5	3.5	7.0
11742133	Special post-disease, chronic disease therapy*	5.5	5.5	7.0
11743300	Nutritional qualities of foods*	2.5	5.5	7.0

Figure 28. SKILL AND KNOWLEDGE REQUIREMENTS FOR TASK SEQUENCES: FACTOR TWO (continued)
p. 3 of 5

Specialty Name: Pediatric Diagnosis and Prescription			
Sequence Level:[a]	4	5	6
Category Number and Name[b]	Highest Necessary Scale Values for Level[c]		
11743400 Nutritional requirements and diets*	5.5	7.0	8.0
11744100 Oral hygiene and care*	3.5	3.5	5.5
11745000 Growth and development	5.5	7.0	8.0
11745300 Infant growth*	3.5	5.5	9.0
11745400 Childhood growth*	5.5	5.5	9.0
11745500 Adolescent growth*	3.5	5.5	8.0
11745600 Adulthood*	3.5	5.5	7.0
11745700 Old age (geriatrics)*	3.5	5.5	5.5
11800000 Microbiology*	2.5	2.5	5.5
12300000 Pharmacology	5.5	5.5	7.0
12331000 Drug toxicity	5.5	5.5	8.0
12332000 Drug idiosyncrasy and allergy pharmacogenetics	5.5	5.5	8.0
12333000 Drug resistance (of a non-genetic nature)*	5.5	5.5	8.0
12334000 Drug tolerance and physical dependence*	5.5	5.5	8.0
12335000 Drug synergism	2.5	5.5	7.0
12341100 Antibacterial and antifungal chemotherapy	2.5	5.5	8.0
12341200 Antiprotozoal/antimetazoal chemotherapy*	2.5	5.5	8.0
12341400 Local chemotherapy*	3.5	5.5	8.0
12342100 Drugs acting on cardiovas. syst., smooth muscle	2.5	5.5	8.0
12342200 Drugs acting on the blood and immunologic system	2.5	5.5	8.0
12342300 Hormones, drugs acting on endocr. glands., etc.	2.5	5.5	8.0
12342400 Vitamins and nutritional agents*	2.5	5.5	8.0
12342500 Drugs influencing growth and development	2.5		8.0
12342600 Drugs for allergy, cough, vomiting, dermat.surfs.*	2.5	5.5	8.0
12342700 Drugs acting on the gastrointestinal tract*	2.5	5.5	8.0
12342800 Drugs acting on the nervous system	2.5	5.5	7.0
12342820 Drugs acting on the neuromuscular system	2.5	3.5	7.0
41660000 Development,growth of behavioral processes of ind*	3.5	5.5	7.0
41666100 Infant behavioral development	3.5	3.5	8.0
41666200 Childhood behavioral development	5.5	3.5	8.0
41666300 Adolescent behavioral development	3.5	3.5	7.0
41666500 Young adulthood behavioral development	2.5	3.5	5.5
41666500 Adult behavioral development	2.5	3.5	
41666600 Old age behavioral development	2.5	3.5	
41690000 Psychopathology*	3.5	5.5	5.5
41691000 Mental retardation*	2.5		7.0
41692000 Organic brain syndrome*	2.5		7.0
41697000 Transient situational disturbances*	2.5		7.0
41710000 Psychotherapy and counseling*	2.5	3.5	5.5
41720000 Organic therapy	1.5	1.5	3.5
41884200 Health services administration and policy	2.5	3.5	3.5

Figure 28. SKILL AND KNOWLEDGE REQUIREMENTS FOR TASK SEQUENCES: FACTOR TWO (continued)
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Specialty Name: Pediatric Diagnosis and Prescription			
Sequence Level:[a]	4	5	6
Category Number and Name[b]	Highest Necessary Scale Values for Level[c]		
41884300 Educational, training services admin., policy	2.5	2.5	
41884600 Child care services administration, policy	3.5	3.5	
41884700 Recreational services administration, policy	2.5	2.5	
41885100 Social agencies (pub.priv.) admin., policy	3.5	3.5	
65620000 Mechanics of writing English	3.5	3.5	5.5
11731610 Mouth, pharynx (digestive function), esophagus		5.5	8.0
11731620 Stomach and small intestine		5.5	8.0
11731630 Large intestine (colon) and rectum		5.5	8.0
11731640 Liver, biliary system, and pancreas		5.5	8.0
11731910 Central nervous system (brain and spinal cord)		5.5	8.0
11731920 Peripheral nervous system		3.5	8.0
11731930 Autonomic nervous system		3.5	8.0
11731941 Olfactory nerve and receptors		3.5	7.0
11731946 Kinesthetic receptors		5.5	7.0
11732221 Conception and contraception*		5.5	7.0
11732300 Homeostasis of fluids		3.5	8.0
11733541 Disorders of the olfactory nerve and receptors		3.5	7.0
11734500 Perinatal morbidity and mortality		5.5	8.0
11735400 Introductory procedures		3.5	5.5
11735600 Suture		3.5	5.5
11735700 Manipulation		3.5	5.5
11736000 Anesthesiology		2.5	3.5
11737100 Bandages, dressings, tourniquets and splints		5.5	8.0
11737500 Foreign bodies not involving wounds*		3.5	7.0
11737600 Resuscitation		3.5	8.0
11742148 Exercise*		3.5	5.5
11743000 Nutrition and dietetics		5.5	5.5
11745100 Embryology and prenatal period		3.5	5.5
11745200 Neo-natal period*		5.5	9.0
12220000 Radiographic (X-ray) analysis		3.5	7.0
12336000 Chemical teratogenesis		3.5	5.5
12341300 Cancer and virus chemotherapy		3.5	7.0
12342810 Drugs acting on the autonomic nervous system		3.5	7.0
12342830 Drugs acting on the central nervous system		3.5	7.0
41523000 Achievement and achievement measurement		1.5	2.5
41695200 Disorders involving addictive behavior		3.5	5.5
41884000 Social service administration and policy		3.5	3.5
41884100 Social services for poor or indigent, admin., policy		3.5	
41884400 Employment services administration, policy		2.5	
41884500 Legal services administration, policy		2.5	
41884800 Special services for the aged or infirm admin., policy		2.5	

Figure 28. SKILL AND KNOWLEDGE REQUIREMENTS FOR TASK SEQUENCES: FACTOR TWO (continued)
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Specialty Name: Pediatric Diagnosis and Prescription			
Sequence Level:[a]	4	5	6
Category Number and Name[b]	Highest Necessary Scale Values for Level[c]		
41884900 Consumer protection services admin., policy		2.5	
42300000 Systems of content presentation		2.5	3.5
43700000 Consumer economics		2.5	
11200000 Genetics*			5.5
11731942 Taste buds			7.0
11731944 Touch, heat, cold and pain receptors			7.0
11733542 Disorders of the taste buds			7.0
11733544 Disorders of touch, heat, cold and pain receptors			7.0
11733546 Disorders of kinesthetic receptors			7.0
11735100 Operative procedures			3.5
11735500 Endoscopy			5.5
11735800 Delivery methods for childbirth			5.5
11739000 Community health and preventive medicine			3.5
11739100 Treatment of social causes of illness			5.5
11742120 Disability evaluation			3.5
11742210 Speech therapy			3.5
11742220 Hearing therapy			3.5
11743100 Biochemistry of nutrients			5.5
11743200 Physiology of nutrients			5.5
12100000 Cell biology			3.5
12311000 Drug receptor theory			7.0
12312000 Drug structure-activity relationships			7.0
12313000 Drug dose-response relationships			7.0
12314000 Non-receptor mediated drug action			7.0
12321000 Drug absorption			7.0
12322000 Drug distribution			7.0
12323000 Drug excretion			7.0
12324000 Drug metabolism			7.0
13900000 Biochemical processes and mechanisms			3.5
41521200 Infant and preschool intelligence; measurement			5.5
41522000 Differential abilities and aptitudes; measurement			5.5
41610000 Sensation and perception			5.5
41693000 Psychoses			5.5
41694000 Neuroses			5.5
41695100 Personality disorders			5.5
41696000 Psychosomatic disorders*			7.0
42630000 Professional and graduate education			2.5

* Asterisk indicates variable determining factor.

[a] Tasks included in levels are as follows. See Table A.1 for task descriptions.
Level 4: 88, 83, 24.
Level 5: 29, 123, 120.
Level 6: 55, 63, 64, 56, 27.

[b] For fuller descriptions of category names see Tables A.2 and A.3.

[c] For descriptions of scales see Chapter 2.

Factor One

Factor One has no tasks that are currently being performed below the physician level. It essentially has three levels represented, from Level 5 to Level 7. (Level 4 contains one task.) As can be seen from Figure 29, Level 7 calls for rises in the skills and knowledge related to the performance of surgery, such as Object Manipulation, Circulatory System, Operative Procedures, Hemorrhage, Bleeding and Their Arrest, Wounds and Their Healing, and Suture. Categories related specifically to diagnosis, such as Genetics, Cell Biology, Poisoning, and Foreign Bodies, disappear in Level 7's surgery tasks. It is interesting to note that no new categories appear between Levels 6 and 7. This is because the decisions about what to do, appear in Level 6, even though Level 7 involves carrying out the surgery tasks.

Unassigned Task Groups

Figure 30 presents the skills and knowledge accounted for by the unassigned task groupings and presents data on the highest scale value required for each, by groups. The Laboratory Related tasks involve at least three levels, and require scale values as high as 7.0 in categories such as Cell Biology and Cell Morphology. On the other hand, the Machine Related and Housekeeping tasks are all at Level 1, and require only Asepsis, Pharmocology and Mechanics of Writing English, at 1.5 for each. Such unassigned tasks can easily be used as entry avenues to factors, since they require little or no formal training aside from skills.

Figure 29. SKILL AND KNOWLEDGE REQUIREMENTS FOR TASK SEQUENCES: FACTOR ONE
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Specialty Name: Surgery, Diagnosis and Prescription				
Sequence Level:[a]	4	5	6	7
Category Number and Name[b]	Highest Necessary Scale Values for Level[c]			
2 Object Manipulation	7.5	7.5	5.0	9.0
4 Human Interaction	7.0	7.0	7.0	7.0
5 Leadership*	1.0	6.5	6.5	6.5
6 Oral Use of a Relevant Language	7.5	7.5	7.5	4.0
7 Reading Use of a Relevant Language	2.0	5.0	5.0	5.0
8 Written Use of a Relevant Language	2.0	5.0	5.0	5.0
9 Decision Making on Methods	4.5	7.0	7.0	7.0
10 Decision Making on Quality	7.0	9.0	9.0	7.0
11 Figural Skills*	5.0	3.5	5.0	5.0
12 Symbolic Skills*	1.5	1.5	1.5	1.5
13 Taxonomic Skills*	5.5	5.5	7.0	7.0
14 Implicative Skills*	8.0	8.0	9.0	9.0
15 Financial Consequences of Error	1.0	1.0	1.0	1.0
16 Consequences of Error To Humans	5.5	9.0	9.0	9.0
11200000 Genetics	5.5	2.5	5.5	
11731000 Normal structure and function*	8.0	8.0	9.0	8.0
11731100 Regional anatomy*	7.0	8.0	9.0	8.0
11731200 Topographic anatomy*	8.0	8.0	8.0	8.0
11731400 Circulatory system*	5.5	8.0	8.0	9.0
11731500 Respiratory system*	5.5	8.0	8.0	8.0
11731600 Digestive system*	5.5	8.0	8.0	8.0
11731700 Urinary system and external genitalia*	8.0	8.0	9.0	9.0
11731810 Muscles*	3.5	7.0	8.0	8.0
11731900 Nervous system*	5.5	7.0	8.0	8.0
11731910 Central nervous system*	3.5	7.0	8.0	8.0
11731920 Peripheral nervous system*	3.5	7.0	8.0	8.0
11731930 Autonomic nervous system*	7.0	7.0	8.0	9.0
11732210 Endocrine glands; hormone physiology*	8.0	8.0	8.0	8.0

* Asterisk indicates variable determining factor.

[a] Tasks included in levels are as follows. See Table A.1 for task descriptions.
Level 4: 42.
Level 5: 45, 40, 53, 28.
Level 6: 21, 46, 43, 9, 39, 10.
Level 7: 47, 49, 48, 44.

[b] For fuller descriptions of category names see Tables A.2 and A.3.

[c] For descriptions of scales see Chapter 2.

Figure 29. SKILL AND KNOWLEDGE REQUIREMENTS FOR TASK SEQUENCES: FACTOR ONE (continued)
p. 2 of 5

Specialty Name: Surgery, Diagnosis and Prescription				
Sequence Level:[a]	4	5	6	7
Category Number and Name[b]	Highest Necessary Scale Values for Level[c]			
11732220 Reproduction*	9.0	8.0	9.0	9.0
11732221 Conception and contraception	9.0	8.0	9.0	9.0
11732222 Male reproductive system	8.0	7.0	8.0	
11732223 Female reproductive system*	9.0	9.0	9.0	9.0
11732400 Metabolism*	8.0	7.0	8.0	8.0
11733000 Pathology*	7.0	8.0	8.0	8.0
11733100 Infective and parasitic diseases*	8.0	8.0	8.0	8.0
11733200 Neoplasms (cancerous growths)*	8.0	7.0	8.0	8.0
11733300 Endocrine, nutritional, metabolic disorders*	8.0	8.0	8.0	9.0
11733510 Disorders of the central nervous system*	5.5	8.0	8.0	8.0
11733520 Disorders of the peripheral nervous system*	5.5	5.5	7.0	8.0
11733530 Disorders of the autonomic nervous system*	5.5	8.0	8.0	8.0
11733600 Disorders of the circulatory system*	5.5	8.0	8.0	9.0
11733700 Disorders of the digestive system*	5.5	8.0	8.0	8.0
11733900 Disorders of the uro-genital system*	8.0	8.0	9.0	9.0
11734400 Disorders,complications of preg.,birth,puerp.	8.0	9.0	9.0	9.0
11734800 Shock and trauma*	3.5	8.0	8.0	9.0
11735000 Surgery*	5.5	5.5	8.0	8.0
11735100 Operative procedures*	5.5	5.5	5.5	8.0
11735400 Introductory procedures*	8.0	9.0	9.0	8.0
11737200 Hemorrhage and bleeding and their arrest*	3.5	8.0	8.0	9.0
11737700 Wounds and their healing*	3.5	8.0	7.0	9.0
11738000 Asepsis*	5.5	5.5	5.5	7.0
11743000 Nutrition and dietetics*	3.5	5.5	5.5	5.5
11745000 Growth and development*	5.5	7.0	8.0	8.0
11745100 Embryology and prenatal period*	8.0	8.0	9.0	9.0
11745500 Adolescent growth	8.0	5.5	8.0	
11745600 Adulthood	8.0	7.0	9.0	
12100000 Cell biology	5.5		3.5	
12110000 Cell morphology	8.0		3.5	
12300000 Pharmacology*	5.5	7.0	7.0	7.0
12313000 Drug dose-response relationships*	5.5	8.0	8.0	7.0
12321000 Drug absorption*	5.5	8.0	8.0	7.0
12322000 Drug distribution*	5.5	8.0	8.0	7.0
12323000 Drug excretion*	5.5	8.0	8.0	7.0
12331000 Drug toxicity*	5.5	8.0	8.0	8.0
12332000 Drug idiosyncrasy, allergy pharmacogenetics*	5.5	8.0	8.0	8.0
12333000 Drug resistance (of a non-genetic nature)*	5.5	8.0	8.0	8.0
12334000 Drug tolerance and physical dependence*	5.5	8.0	8.0	7.0
12335000 Drug synergism*	5.5	7.0	8.0	7.0
12341100 Antibacterial, antifungal chemotherapy*	5.5	8.0	8.0	8.0

Figure 29. SKILL AND KNOWLEDGE REQUIREMENTS FOR TASK SEQUENCES: FACTOR ONE (continued)
p. 3 of 5

Specialty Name: Surgery, Diagnosis and Prescription					
Sequence Level:[a]		4	5	6	7
Category Number and Name[b]		Highest Necessary Scale Values for Level[c]			
12341200	Antiprotozoal/antimetazoal chemotherapy*	5.5	5.5	8.0	8.0
12342300	Hormones,drugs acting on endoc.glnds.etc.*	5.5	8.0	8.0	8.0
12342800	Drugs acting on the nervous system*	5.5	5.5	8.0	8.0
13900000	Biochemical processes and mechanisms*	5.5	3.5	5.5	5.5
41642000	Sex drives	5.5	3.5	3.5	
41650000	Emotions	3.5	3.5	3.5	
41696000	Psychosomatic disorders*	3.5	3.5	7.0	
41710000	Psychotherapy and counseling	2.5		3.5	
65620000	Mechanics of writing English*	3.5	5.5	5.5	5.5
11731300	Hematopoietic system*		5.5	7.0	5.5
11731610	Mouth, pharynx, esophagus*		5.5	8.0	8.0
11731620	Stomach and small intestine*		8.0	8.0	9.0
11731630	Large intestine (colon) and rectum*		8.0	8.0	9.0
11731640	Liver, biliary system, and pancreas*		8.0	8.0	9.0
11731820	Bones and joints*		7.0	7.0	8.0
11731831	Skin and sweat glands*		5.5	7.0	8.0
11731941	Olfactory nerve and receptors		5.5	8.0	
11731943	Eye and optic nerve*		5.5	5.5	5.5
11731944	Touch, heat, cold and pain receptors		5.5	5.5	
11731945	The ear (excluding balance function)*		5.5	5.5	5.5
11731946	Kinesthetic receptors		5.5	5.5	
11732100	Immunologic system*		7.0	8.0	5.5
11732300	Homeostasis of fluids*		7.0	9.0	8.0
11733400	Disorders of blood, blood-forming organs		7.0	8.0	
11733543	Disorders of the eye and optic nerve		5.5	5.5	
11733544	Disorders of touch, heat, cold, pain receptors		5.5	5.5	
11733545	Disorders of the ear		5.5	5.5	
11733546	Disorders of kinesthetic receptors		5.5	5.5	
11733800	Disorders of the respiratory system*		8.0	8.0	8.0
11734100	Disorders of the skin, subcutaneous tissues*		5.5	8.0	8.0
11734200	Disorders of the musculoskel.syst.,conn. tissues*		5.5	7.0	8.0
11734300	Congenital abnormalities		8.0	9.0	8.0
11734500	Perinatal morbidity and mortality		8.0	9.0	9.0
11734600	Burns		8.0	8.0	
11734700	Poisoning		8.0	8.0	
11735300	Repair surgery		3.5	5.5	8.0
11735500	Endoscopy*		5.5	5.5	8.0
11735600	Suture*		5.5	5.5	8.0
11735700	Manipulation*		5.5	5.5	7.0
11735800	Delivery methods for childbirth		8.0	9.0	8.0
11736000	Anesthesiology*		5.5	8.0	8.0

Figure 29. SKILL AND KNOWLEDGE REQUIREMENTS FOR TASK SEQUENCES: FACTOR ONE (continued)
p. 4 of 5

Specialty Name: Surgery, Diagnosis and Prescription				
Sequence Level:[a]	4	5	6	7
Category Number and Name[b]	Highest Necessary Scale Values for Level[c]			
11737000 First aid and care*		8.0	7.0	8.0
11737100 Bandages, dressings, tourniquets, splints*		5.5	7.0	9.0
11737300 Handling, transportation of sick, wounded		8.0	7.0	
11737400 Sprains, strains, fractures and their healing		8.0	7.0	
11737500 Foreign bodies not involving wounds		8.0	5.5	
11737600 Resuscitation*		8.0	8.0	9.0
11741000 Epidemiology		5.5	5.5	
11742132 Corrective, preventive, compensatory adjustments		3.5	5.5	
11742133 Special post-disease, chronic disease therapy		5.5	8.0	
11742148 Exercise		2.5	3.5	3.5
11743100 Biochemistry of nutrients*		5.5	5.5	5.5
11743200 Physiology of nutrients*		5.5	5.5	5.5
11743300 Nutritional qualities of foods		5.5	2.5	
11743400 Nutritional requirements and diets*		8.0	8.0	5.5
11744100 Oral hygiene and care		3.5	3.5	
11800000 Microbiology		3.5	5.5	
12200000 Radiology		3.5	5.5	5.5
12210000 Radiobiology		3.5	5.5	
12220000 Radiographic (X-ray) analysis*		5.5	5.5	5.5
12311000 Drug receptor theory		5.5	7.0	
12312000 Drug structure-activity relationships		5.5	7.0	
12314000 Non-receptor mediated drug action		5.5	7.0	
12324000 Drug metabolism		5.5	7.0	
12336000 Chemical teratogenesis		8.0	8.0	5.5
12341400 Local chemotherapy		5.5	8.0	
12342100 Drugs acting on cardiovasc.syst.,smooth muscles*		7.0	8.0	8.0
12342200 Drugs acting on the blood, immunologic system*		7.0	8.0	8.0
12342400 Vitamins and nutritional agents*		5.5	7.0	7.0
12342500 Drugs influencing growth and development		5.5	5.5	
12342600 Drugs for allergy,cough,vomit.,dermatomuc.surfs.*		7.0	8.0	7.0
12342700 Drugs acting on the gastrointestinal tract*		7.0	8.0	8.0
12342810 Drugs acting on the autonomic nervous system		5.5	8.0	
12342820 Drugs acting on the neuromuscular system		5.5	8.0	
12342830 Drugs acting on the central nervous system		5.5	8.0	
41660000 Development, growth of behav. processes of indiv.		5.5	3.5	
41690000 Psychopathology		5.5	5.5	
41694000 Neuroses		3.5	3.5	
41695200 Disorders involving addictive behavior		3.5	5.5	
41697000 Transient situational disturbances*		3.5	5.5	
41884200 Health services administration and policy		3.5	3.5	
42630000 Professional and graduate education		1.5	2.5	

Figure 29. SKILL AND KNOWLEDGE REQUIREMENTS FOR TASK SEQUENCES: FACTOR ONE (continued)
p. 5 of 5

Specialty Name: Surgery, Diagnosis and Prescription				
Sequence Level:[a]	4	5	6	7
Category Number and Name[b]	Highest Necessary Scale Values for Level[c]			
11731832 Hair			7.0	
11731833 Nails			5.5	
11731942 Taste buds			5.5	
11733541 Disorders of the olfactory nerve, receptors			5.5	
11733542 Disorders of the taste buds			5.5	
11735200 Amputation and disarticulation			3.5	
11739000 Community health and preventive medicine			3.5	
11739430 Sanitation			2.5	
11742100 Physical therapy			3.5	
11742120 Disability evaluation			2.5	
11742131 Amputation adjustments			3.5	
11742143 Heat therapy			3.5	
11745200 Neo-natal period			5.5	5.5
11745400 Childhood growth			7.0	
11745700 Old age (geriatrics)			9.0	
12120000 Cell physiology			3.5	
14111000 Solutions			5.5	
14128000 Separation methods in analysis			3.5	
41691000 Mental retardation			3.5	
41692000 Organic brain syndrome			5.5	
41693000 Psychoses			5.5	

* Asterisk indicates variable determining factor.

[a] Tasks included in levels are as follows. See Table A.1 for task descriptions.
Level 4: 42.
Level 5: 45, 40, 53, 28.
Level 6: 21, 46, 43, 9, 39, 10.
Level 7: 47, 49, 48, 44.

[b] For fuller descriptions of category names see Tables A.2 and A.3.

[c] For descriptions of scales see Chapter 2.

Figure 30. SKILL AND KNOWLEDGE REQUIREMENTS FOR UNASSIGNED TASK GROUPINGS[a]
p. 1 of 3

Name of Grouping: Laboratory Related Tasks (14 Tasks)		
Category Name and Number[b] (Tasks 36, 14, 35, 139, 207, 172, 141, 98, 108, 140, 155, 97, 147, 196.)	Total Tasks	Highest Necessary Scale Values for Group[c]
2 Object Manipulation	14	3.5
4 Human Interaction	11	5.0
6 Oral Use of a Relevant Language	11	4.0
7 Reading Use of a Relevant Language	14	2.0
8 Written Use of a Relevant Language	12	2.0
9 Decision Making on Methods	14	1.5
10 Decision Making on Quality	14	3.5
11 Figural Skills	8	5.0
12 Symbolic Skills	1	1.5
13 Taxonomic Skills	3	5.5
14 Implicative Skills	8	5.0
15 Financial Consequences of Error	11	1.0
16 Consequences of Error To Humans	14	7.0
11731100 Regional anatomy	1	1.5
11731630 Large intestine (colon) and rectum	1	1.5
11731700 Urinary system and external genitalia	1	1.5
11733000 Pathology	2	1.5
11733100 Infective and parasitic diseases	3	1.5
11733200 Neoplasms (cancerous growths)	1	3.5
11733300 Endocrine, nutritional, and metabolic disorders	2	1.5
11733400 Disorders of blood and blood-forming organs	1	1.5
11733700 Disorders of the digestive system	1	1.5
11733900 Disorders of the uro-genital system	1	1.5
11734100 Disorders of the skin and subcutaneous tissues	2	1.5
11734700 Poisoning	1	1.5
11738000 Asepsis	2	1.5
11800000 Microbiology	3	5.5
11900000 Molecular biology	1	5.5
12100000 Cell biology	2	7.0
12110000 Cell morphology	2	7.0
12120000 Cell physiology	1	5.5
13900000 Biochemical processes and mechanisms	1	5.5
14121000 Mechanical analysis	1	2.5
14128000 Separation methods in analysis	2	2.5
65620000 Mechanics of writing English	3	2.5

[a] Unassigned to any task factor by virtue of low factor loadings and/or unrelatedness to context of factor content.

[b] See Table A.1 for task descriptions. For fuller descriptions of category names see Tables A.2 and A.3.

[c] For descriptions of scales see Chapter 2.

Figure 30. SKILL AND KNOWLEDGE REQUIREMENTS FOR UNASSIGNED TASK GROUPINGS[a] (continued)
p. 2 of 3

Name of Grouping: Administrative Tasks (9 Tasks) Category Name and Number[b] (Tasks 165, 186, 242, 157, 134, 164, 220, 160, 75.)	Total Tasks	Highest Necessary Scale Values for Group[c]
4 Human Interaction	8	3.0
5 Leadership	1	3.0
6 Oral Use of a Relevant Language	8	4.0
7 Reading Use of a Relevant Language	8	5.0
8 Written Use of a Relevant Language	4	5.0
9 Decision Making on Methods	9	3.0
10 Decision Making on Quality	9	7.0
12 Symbolic Skills	1	1.5
14 Implicative Skills	2	2.0
15 Financial Consequences of Error	5	1.0
16 Consequences of Error To Humans	8	1.0
65620000 Mechanics of writing English	2	2.5
69214200 Spanish	1	5.5

Name of Grouping: Inventory and Supply Related Tasks (19 Tasks) Category Name and Number[b] (Tasks 76,128,129,235,150,264, 136,130,151,176,266,80,230,137,168,169,231,265,184.)	Total Tasks	Highest Necessary Scale Values for Group[c]
2 Object Manipulation	9	1.5
4 Human Interaction	13	1.0
5 Leadership	2	1.0
6 Oral Use of a Relevant Language	13	2.0
7 Reading Use of a Relevant Language	17	2.0
8 Written Use of a Relevant Language	10	2.0
9 Decision Making on Methods	15	3.0
10 Decision Making on Quality	17	3.5
11 Figural Skills	3	1.0
12 Symbolic Skills	4	1.5
14 Implicative Skills	3	1.0
15 Financial Consequences of Error	15	1.0
16 Consequences of Error To Humans	19	5.5
11738000 Asepsis	2	1.5
12300000 Pharmacology	1	1.5
65620000 Mechanics of writing English	1	1.5

Figure 30. SKILL AND KNOWLEDGE REQUIREMENTS FOR UNASSIGNED TASK GROUPINGS[a] (continued)
p. 3 of 3

Name of Grouping: Machine Related and Housekeeping Tasks (18 Tasks)		
Category Name and Number[b] (Tasks 135,145,175,178,149,174, 70,2,268,72,269,267,223,69,222,144,146,273.)	Total Tasks	Highest Necessary Scale Values for Group[c]
2 Object Manipulation	17	3.5
4 Human Interaction	4	1.0
6 Oral Use of a Relevant Language	4	4.0
7 Reading Use of a Relevant Language	2	2.0
8 Written Use of a Relevant Language	1	2.0
9 Decision Making on Methods	13	1.5
10 Decision Making on Quality	12	3.5
11 Figural Skills	4	1.0
14 Implicative Skills	1	1.0
15 Financial Consequences of Error	14	1.0
16 Consequences of Error To Humans	15	2.0
11738000 Asepsis	7	1.5

[a] Unassigned to any task factor by virtue of low factor loadings and/or unrelatedness to context of factor content.

[b] See Table A.1 for task descriptions. For fuller descriptions of category names see Tables A.2 and A.3.

[c] For descriptions of scales see Chapter 2.

LATTICE RELATIONSHIPS

The fact that there were 17 tasks which were retained on two task factors each suggests some likely possibilities for lattice relationships. The most obvious of these are the two diagonal movements from Factor Four, Level 2 to Factor Six's lowest point, Level 3, and from Factor Five, Level 2 to Factor Six, Level 3. Task 258 links Factor Four, Level 2 to Factor Six, Level 3. Since Factor Five,Level 3 and Factor Six,Level 3 share three tasks (143, 117 and 118), the diagonal rise to Level 3 of Factor Six from Level 2 of Factor Five seemed justified.

Figures 24 through 29 become the source of data which make it possible to compare the educational gaps between lattice movements. By comparing the skills and knowledges and levels required for a given target level in a task sequence with the skill and knowledge levels already attained in the potential source level,the required educational distance can be ascertained.

Figure 31 shows how such a comparison is made. The Figure compares the educational gap to reach Level 3 of Factor Six from an origin in Factor Four, Level 2 with the gap from an origin in Factor Five, Level 2. For each origin the Figure presents only the gaps. That is, it is assumed that any category or skill required for Factor Six,Level 3 (Figure 26) whose level has already been met by Levels 1 or 2 in the respective Factor of origin (Four or Five) will not be shown on Figure 31. What is

Figure 31. COMPARISON OF TRAINING GAPS RELATED TO TASK FACTOR LATTICES: DIAGONAL MOBILITY

Comparison: Factor Five, Level 2 to Factor Six, Level 3			with: Factor Four, Level 2 to Factor Six, Level 3		
Category Code Number and Name	Highest Level Reached	Level Now Needed	Category Code Number and Name	Highest Level Reached	Level Now Needed
2 Object Manipulation	3.5	5.0	2 Object Manipulation	3.5	5.0
4 Human Interaction	5.0	7.0	4 Human Interaction	5.0	7.0
6 Oral Use of a Relevant Language	4.0	7.5	16 Consequences of Error To Humans	5.5	7.0
8 Written Use of a Relevant Language	2.0	5.0	11731100 Regional anatomy	1.5	2.5
14 Implicative Skills	1.0	5.0	11731700 Urinary syst.,external genit.	1.5	2.5
11731100 Regional anatomy	1.5	2.5	11732220 Reproduction	2.5	3.5
11733000 Pathology	1.5	2.5	11738000 Asepsis	1.5	3.5
11735400 Introductory procedures	1.5	2.5			
11738000 Asepsis	2.5	3.5			
5 Leadership	-	1.0	11731400 Circulatory system	-	1.5
13 Taxonomic Skills	-	2.0	11731600 Digestive system	-	1.5
11731000 Normal structure and function	-	2.5	11733600 Disorders of circ.system	-	1.5
11731600 Digestive system	-	1.5	11733700 Disorders of digest.system	-	1.5
11731700 Urinary syst.,external genit.	-	2.5	11735400 Introductory procedures	-	2.5
11732220 Reproduction	-	3.5	11800000 Microbiology	-	3.5
11732221 Conception and contracept.	-	3.5	14128000 Separation methods in analys.	-	1.5
11732222 Male reproductive syst.	-	1.5			
11732223 Female reproductive syst.	-	3.5			
11733200 Neoplasms	-	1.5			
11733600 Disorders of circ. syst.	-	1.5			
11733900 Disorders of uro-genit.syst.	-	2.5			
11800000 Microbiology	-	3.5			
14128000 Separation methods in analys.	-	1.5			
65620000 Mechanics of writing English	-	2.5			

Summary	Categories with Rise in Level	New Categories
Five (2) to Six (3)	9	15
Four (2) to Six (3)	7	5

shown is the increased levels for categories and any new categories to be taught in order to comply with the needs of Factor Six, Level 3.[3]

By comparing the two gaps related to the two origins it can be seen that more categories must be newly taught and more must be taught at a higher level in the movement from Factor Five than in the movement from Factor Four. All other things being equal, performers doing the tasks of Level 2 in Factor Four require a smaller training investment than those doing the tasks of Level 2 in Factor 5 to reach Level 3 of Factor Six.

Figure 32 presents summary data on several other possible lattice movements. In each case the data were arrived at in a manner similar to that described for arriving at Figure 31. The comparisons include alternative diagonal moves, the choice between diagonal and vertical moves, alternative lateral moves, and what appears to be downward lateral moves to enter Factors One and Two.

The data in Figure 32 indicate one overriding regularity, namely, the higher the level, the greater the number of categories to be taught at a higher level or as new categories. Comparisons 1, 2 and 5 deal with

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[3] It should be noted that the level could be lower in the Level of origin than needed, but an earlier level could have reached the level now required in the target Level, and there would be no gap for the category. It should also be noted that earlier levels than the target Level could have required higher scale values than that of the target Level, but the gap in the requirement for the lattice would reflect only the target Level. In the case of Figure 31, there was no earlier level, since Factor Six starts at Level 3.

Figure 32. COMPARISON OF LATTICE MOBILITY NEEDS

	Point of Origin: Factor and Level	Target: Factor and Level	Categories with Rise in Level	New Categories	Preferred Choice
1.	Factor Four, Level 2	Factor Six, Level 3	7	5	X
	Factor Five, Level 2	Factor Six, Level 3	9	15	
2.	Factor Five, Level 3	Factor Six, Level 4	15	27	about
	Factor Six, Level 3	Factor Five, Level 4	19	24	equal
3.	Factor Five, Level 3	Factor Six, Level 4	15	27	X
	Factor Five, Level 3	Factor Five, Level 4	35	21	
4.	Factor Six, Level 3	Factor Five, Level 4	19	24	X
	Factor Six, Level 3	Factor Six, Level 4	22	36	
5.	Factor Five, Level 4	Factor Six, Level 5	35	28	X
	Factor Six, Level 4	Factor Five, Level 5	45	44	
6.	Factor Five, Level 4	Factor Six, Level 5	35	28	about
	Factor Five, Level 4	Factor Five, Level 5	42	20	equal
7.	Factor Six, Level 4	Factor Five, Level 5	45	44	about
	Factor Six, Level 4	Factor Six, Level 5	45	41	equal
8.	Factor Five, Level 5	Factor Six, Level 5	10	10	X
	Factor Six, Level 5	Factor Five, Level 5	23	12	
9.	Factor Six, Level 5	Factor Two, Level 4	31	23	
	Factor Two, Level 4	Factor Six, Level 5	23	20	X
10.	Factor Five, Level 6	Factor One, Level 5	52	29	about
	Factor One, Level 4	Factor One, Level 5	58	21	equal

diagonal mobility. Each is at a higher level than before. There is an increasing number of categories to be dealt with at each level.

The movement from Factor Four to Factor Six (in comparison 1) is preferred over that from Five to Six. The movement from Factor Five, Level 3 to Factor Six, Level 4 (comparison 2) requires about the same education as its mirror image for Factor Six, Level 3 to Factor Five, Level 4. In the case of comparison 5, the distance from Factor Five Level 4, to Factor Six, Level 5 is shorter than its mirror image.

Comparisons 2 and 5 are shown contrasted with the alternative movement within the given factor. In the case of comparison 2, from Level 3 to Level 4, the two equal lattice movements are shorter than their counterpart vertical movements within factors (comparisons 3 and 4). This advantage in moving across factors no longer appears in going from Level 4 to Level 5. There is no appreciable difference in the educational distance between the vertical and the diagonal movements.

Comparison 8 indicates the relatively small training distance across factors at the same level when there is some task overlap. Tasks 41 and 50 appear at the same level in both Factors Five and Six. However, the movement from Five to Six remains shorter than that from Six to Five.

Comparisons 9 and 10 are presented to indicate the way into Factors Two and One. It is necessary to move downward in level from one of the four narrower, multi-level factors to enter the two broad professional-level factors. In the case of comparison 9, there is the possi-

bility of a reverse movement from Factor Two, Level 4 to Factor Six, Level 5, with only one level left to be reached in Factor Six. This latter movement entails less education than the movement from Factor Six to Factor Two.

Factor One seems approachable through Level 5. Task 28 is present at that level and in Factor Five, Level 6. The distance from Factor Five to Factor One is contrasted with the vertical distance within Factor One from Level 4 to Level 5 (since the movement from Factor One to Factor Five is not likely). The educational distances are about the same, even though there is a downward, diagonal movement in the lattice as compared with a vertical movement in the ladder. The breadth of Factor One accounts for the discrepancy.

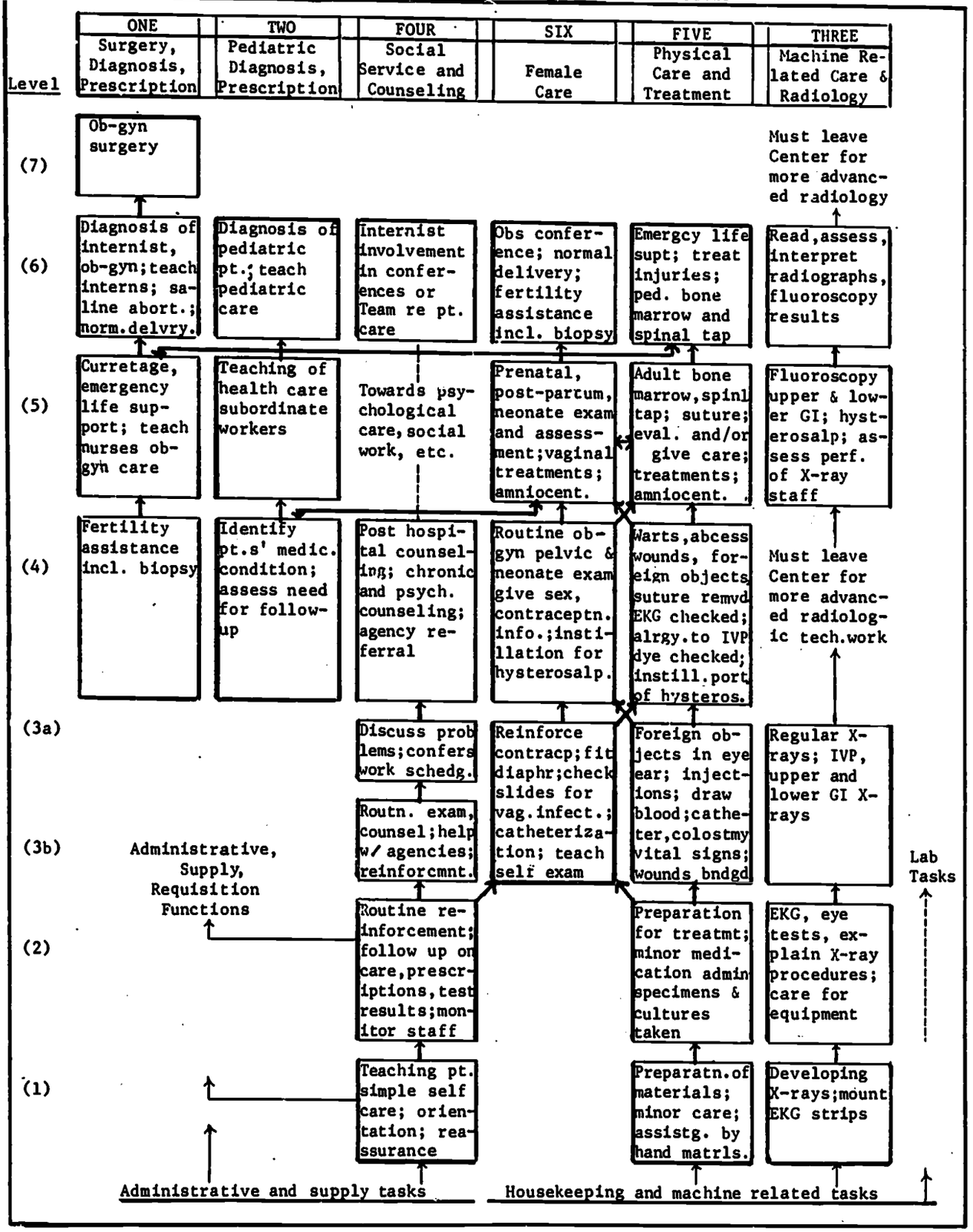
The analysis thus indicates that lattice as well as ladder movements are realistic,and that their relative educational efforts can be compared. This means that specialized, flexible educational programs can be designed using the task data for the initial analysis.

Figure 33 represents a graphic summary of the work discussed so far. In it the task content of the various levels are summarized, and the lattice possibilities are shown.

CURRENT EDUCATIONAL LOCATIONS

The foregoing sections of this chapter dealt with general educational levels for task sequences. This section presents the task sequences along with data indicating where the training of the tasks might now be

Figure 33. GRAPHIC SUMMARY OF TASK SEQUENCES AND LATTICES



found. This part of the chapter is to be considered indicative. The data come from the curriculum work described at the end of Chapter 2. Only one program for each educational type was sampled, and the respondents dealt only with the task names. They responded to their concept of what is needed to teach persons so that they can carry out the tasks. (The reader is directed to Chapter 2 and Appendixes B.1 and B.2 for a review of the methodology involved.)

Figures 34 through 40 show the names of the tasks of each of the task factors or task groupings in very abbreviated form for the sake of space. (The respondents were presented with the document shown in Appendix B.1.) Next to each task title(s), the current performer in the pilot test is listed. The next seven columns on the right stand for the six educational programs consulted. The column marked "C" stands for the Center's own training department. Next to each task is entered the letters A, B, or C if any of these were chosen by the respondent of the given program. These letters stand for given degrees of the curriculum content represented in the task which is said to be covered by the program.

In the case of the Center, there were three programs (Nurse Practitioner, Family Health Worker, and Medical Assistant). The highest letter chosen, regardless of the title of the program, appears in the Figures even when the title of the performer does not match the title of the program. The reason is that these Figures deal with the institutional location of the curriculum contents represented by the tasks rather than the titles.

The Figures are presented for the possible light they might shed or the insights that might be gained about current health manpower education.

Factor One

Factor One is presented in Figure 34. This Figure indicates that much professional level work is taught after medical school. The surgery tasks seem to be covered later as are the other tasks involving a "laying on of hands." It is interesting to note, however, that the medical school claims to fully teach the diagnostic tasks.

Factor Two

Factor Two has a pattern similar to that of Factor One with regard to the professional level tasks. Figure 35 suggests that the medical school teaches diagnostics, but not necessarily how to teach (task 27). The Nurse Practitioner tasks are echoed in the RN Baccalaureate program and are also covered by the medical school.

Factor Three

Inspection of Figure 36 suggests that the Radiologist is prepared outside of medical school, but that physicians learn how to read X-rays in medical school. The tasks of EKG are apparently covered only at the upper and the lower levels. The medical student and the performer hired for the job both learn EKG tasks, but nursing programs and radiologic programs do not seem to cover them. On the other hand, the reading of EKG's is dealt with at varying program levels.

Figure 34. CURRENT EDUCATIONAL SOURCES FOR TASK SEQUENCES: FACTOR ONE, SURGERY, DIAGNOSIS AND PRESCRIPTION SPECIALTY

Task Code No.	Abbreviated Name of Task	Current Titles[a]	Curriculum Location[b]					
			C	LPN	X	D-RN	A-RN	B-RN	MD
47	Surg.excision of uterus,ovaries: hysterectomy through abdomen or vagina.	OB-GYN				C			C
49	Ligation of fallopian tubes.	OB-GYN							C
48	Vag.plastic surg. or correc. vag.hernia.	OB-GYN				C			C
44	Cesarean section delivery.	OB-GYN							C
21	Informal instr. of interns,res.in pt.care	INT	not in questionnaire						
46	Saline abortion.	OB-GYN	C						C
43	Delivery of baby through vagina.	OB-GYN				C		C	A
9	Diag.med.cond;decidg.care, non-child pt.	INT	B			C			A
39	Diag.ob-gyn cond.,decidg.,care,(fem.pt.)	OB-GYN	B			C		C	A
10	Decidg whether to proceed with care, administer medication to non-child pt.	INT	B	C		B		A	A
45	Currettage abortion.	OB-GYN							C
40	Decidg.wheth.to adm.or change med fem.pt.	OB-GYN	B	C		B			A
53	Instructg. nurses in ob-gyn pt. care.	OB-GYN	not in questionnaire						
28	Emergency life support care.	INT PED	B	B		A	C	A	B
42	Providg fertility assist. for female pt.	OB GYN	C				C	B	B

[a] Radiologist = RAD; Internist = INT; Obstetrician-Gynecologist = OB-GYN; Pediatrician = PED; Lead X-ray Tech. and X-ray Tech. = X-ray; Nurse Practitioner = NP; LPN-Unit = LPN-U; LPN-Emergency = LPN-E; Family Health Worker = FHW; MEdical Assistant-Unit = MA-U; EKG Tech. = EKG; Dark Room Aide = DRA.

[b] C = Center; LPN = LPN Program; X = Radiologic Technician Program; D-RN = Diploma RN Program; A-RN = Associate Degree RN Program; B-RN = Baccalaureate RN Program; MD = Medical School. Within columns, C = covers small amount of curriculum content; B = covers significant amount; A = covers all or most of curriculum content needed for task.

Figure 35. CURRENT EDUCATIONAL SOURCES FOR TASK SEQUENCES: FACTOR TWO, PEDIATRIC SPECIALTY IN DIAGNOSIS AND PRESCRIPTION

Task Code No.	Abbreviated Name of Task	Current Titles[a]	Curriculum Location[b]					
			C	LPN	X	D-RN	A-RN	B-RN	MD
55	Diagnosing health, development; deciding care for pediatric patient.	PED	B			C		B	A
63	Lectures, tests for Nurse Pract.; delegation of duties considered.	PED	C					C	
64	Informally training Nurse Pract.; delegation of duties considered.	PED	not in questionnaire						
56	Deciding whether to go ahead with pediatric care and administer medication.	PED	B	C		B		A	A
27	Lectures to staff and students on health and medical subjects.	INT OB-GYN	B	C		C		A	C
29	Informally instructing subordinates in patient care.	INT PED	not in questionnaire						
123	Instructing Family Health Workers or Nurse-interns in patient care.	NP	not in questionnaire (see task 27)						
120	Preparing, presenting classes for Family Health Workers; evaluating students.	NP	C					C	
88	Identifying juvenile's health condition.	NP	A			B			A
83	Identifying obvious medical condition of adult and follow-up on care.	NP	A			C		A	A
24	Assessing urgency of follow up for no-show patients.	INT OB-GYN PED	not in questionnaire						

[a] Radiologist = RAD; Internist = INT; Obstetrician-Gynecologist = OB-GYN; Pediatrician = PED; Lead X-ray Tech. and X-ray Tech. = X-ray; Nurse Practitioner = NP; LPN-Unit = LPN-U; LPN-Emergency = LPN-E; Family Health Worker = FHW; Medical Assistant-Unit = MA-U; EKG Tech. = EKG; Dark Room Aide = DRA.

[b] C = Center; LPN = LPN Program; X = Radiologic Technician Program; D-RN = Diploma RN Program; A-RN = Associate Degree RN Program; B-RN = Baccalaureate RN Program; MD = Medical School. Within columns, C = covers small amount of curriculum content; B = covers significant amount; A = covers all or most of curriculum content needed for task.

Figure 36. CURRENT EDUCATIONAL SOURCES FOR TASK SEQUENCES: FACTOR THREE, SPECIALTY IN MACHINE RELATED CARE AND RADIOLOGY

Task Code No.	Abbreviated Name of Task	Current Titles[a]	Curriculum Location[b] C	LPN	X	D-RN	A-RN	B-RN	MA
6	Readg.,assessg X-ray;makg recommendations.	RAD			C				B
8	Answering MD questions about radiographs.	RAD	not in questionnaire						
1	Fluoroscopy of lower intestinal tract.	RAD			C				
3	Fluoroscopy of upper GI tract.	RAD			B	C			
4	Fluoros.portion of hysterosalpyngography.	RAD			C				
7	Assesg.performce,output,of X-ray workers.	RAD	not in questionnaire						
20	Reading and interpreting "stat" X-rays on request.	INT PED			C				B
68	Preparing pt. and barium drink for fluoroscopy and taking upper GI X-rays.	X-ray			A				C
67	Taking lower GI series X-rays, scout film.	X-ray			A				
65	Takg.X-rays with vert.or table X-ray mach.	X-ray			A				
66	Taking IVP X-rays after allergy test.	X-ray			A				
81	Assessing quality of radiographs.	X-ray			A				A
73	Reassuring pt. about X-ray procedures.	X-ray	not in questionnaire						
74	Re-explaing.pre-X-ray home procedures.	X-ray	not in questionnaire						
262	Preparing pt.; taking electrocardiogram.	EKG	A			C			A
270	Demonstratg.and instructg.;taking EKG.	EKG	A			C			A
257	Givg.vision tests (Keystone,Snellin).	MA-U	B			C			C
99	Administering Snellin eye test.	NP	B			A			A
82	Calling repair company re X-ray equipment.	X-ray	not in questionnaire						
79	Preparing barium enema.	X-ray			A				
132	Checking and caring for equipment.	LPN-U LPN-E	B	C		A	C		
271	Deciding if EKG reading looks suspicious.	EKG	C			A		A	A
71	Developing radiographs using hand developer.	X-ray DRA			A				
78	Preparg.radiograph packet for interpret.	X-ray	not in questionnaire						
263	Cutting and mounting an EKG strip.	EKG	A						
272	Checkg.level of developer, fixer solution.	DRA			A				

[a] Radiologist = RAD; Internist = INT; Obstetrician-Gynecologist = OB-GYN; Pediatrician = PED; Lead X-ray Tech. and X-ray Tech. = X-ray; Nurse Practitioner = NP; LPN-Unit = LPN-U; LPN-Emergency = LPN-E; Family Health Worker = FHW; Medical Assistant-Unit = MA-U; EKG Tech. = EKG; Dark Room Aide = DRA.

[b] C = Center; LPN = LPN Program; X = Radiologic Technician Program; D-RN = Diploma RN Program; A-RN = Associate Degree RN Program; B-RN = Baccalaureate RN Program; MD = Medical School. Within columns, C = covers small amount of curriculum content; B = covers significant amount; A = covers all or most of curriculum content needed for task.

Factor Four

It appears from Figure 37 that much of the counseling done by the Nurse Practitioner is taught at the BA level in nursing and also in the medical school. The social service and reinforcement functions of the Family Health Worker appear in the BA nursing program.

The indication is that the training for many of the other tasks could be duplicated across educational levels. It cannot be completely clear until actual curriculum content is analyzed. Since this factor reflects a good deal of emphasis on Decision Making on Methods and on Quality, varying levels for the same overall task names could be involved.

Factor Five

Factor Five is the Physical Treatment factor. As Figure 38 indicates, all of the tasks of the factor were represented in the questionnaire. It is interesting to note that, among the 24 tasks of the three upper levels, only nine are accounted for with an A at medical school; eight have an A at the BA-RN level; six have an A at the Diploma-RN level; and three are covered at the Center.[4] Taking bone marrow, response to cardiac arrest, amniocentesis, suturing, vaginal treatments, removal of warts, testing for IVP-dye allergy, incising and draining abscesses, removal of objects from the pharynx, and the instillation portion of the hysterosalpyngography are all unaccounted for with an A by any of the programs.

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[4] "A" refers to coverage of all or most of the content needed for the task.

Figure 37. CURRENT EDUCATIONAL SOURCES FOR TASK SEQUENCES: FACTOR FOUR, SOCIAL SERVICE AND COUNSELING SPECIALTY
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Task Code No.	Abbreviated Name of Task	Current Titles[a]	Curriculum Location[b] C	LPN	X	D-RN	A-RN	B-RN	MD
25	Particip.in Family Health Team conf.as Int.	INT	not in questionnaire						
90	Post-hosp.visit to chronic schizophren.pt.	NP	B			C		A	A
125	RN committee work on health procedures.	NP	not in questionnaire						
121	Particip.in Family Health Team conf.as NP.	NP	not in questionnaire						
114	Pragmatic counselg.for pt. on pers.probs.	NP	A	C		B	C	A	A
101	Counseling in sex,contracept.,VD,abortion.	NP	A	C		C	C	A	A
102	Chronic or special care procedures for daily living reinforced or explnd.to pt.	NP	B	B		B	B	A	A
115	Deciding on and arranging referral of patient to agency.	NP	A	C		B		A	
110	Answering pt.'s quest.on care at RN level.	NP	not in questionnaire						
236	Discussg.pers.,soc.,health probs.with pt.	FHW	A	B		A	C	A	B
26	Participating in committees at institution.	INT PED	not in questionnaire						
239	Particip.in Fam.Health Team conf. as FHW	FHW	not in questionnaire						
127	Work scheds.planned and approved re pts.	NP	not in questionnaire						
23	Filling in forms and letters describing patient's medical condition for institutions.	INT OB-GYN PED		C		A		A	A
111	Safety inspection of patient's home.	NP	B	B		B	B	A	A
241	Providg.job orient.to new co-worker FHW.	FHW	not in questionnaire						
219	Accompanying pt. to any social agency.	FHW	not in questionnaire						
122	Coordinating multi-agency exams for pt.	NP	not in questionnaire						
252	Conductg.routine exam of chron.disease pt.	FHW	A			A	C	A	A
148	Answer pt.'s phone quest.at LPN capability	LPN-U	not in questionnaire						
154	Participating in Unit conf. as LPN.	LPN-U	not in questionnaire						

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[b] C = Center; LPN = LPN Program; X = Radiologic Technician Program; D-RN = Diploma RN Program; A-RN = Associate Degree RN Program; B-RN = Baccalaureate RN Program; MD = Medical School. Within columns, C = covers small amount of curriculum content; B = covers significant amount; A = covers all or most of curriculum content needed for task.

Figure 37. CURRENT EDUCATIONAL SOURCES FOR TASK SEQUENCES: FACTOR FOUR, SOCIAL SERVICE AND COUNSELING SPECIALTY (continued)
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Task Code No.	Abbreviated Name of Task	Current Titles[a]	Curriculum Location[b]					
			C	LPN	X	D- RN	A- RN	B- RN	MD
249	Conducting routine post partum exam.	FHW		B		A	A	A	A
203	Reinforcing diet and making ethnic substitutes.	LPN-U FHW	B	B		A	B	A	A
158	Informally evalg.,teachg.subord.Med.Assts.	LPN-U	not in questionnaire						
237	Discussg.consum.protect.;helpg.w/budget.	FHW	A	B		C		A	
245	Orientg.,takg.intake info.from new family.	FHW	A			B		B	C
226	Givg.basic sex ed.,contracept.,abort.info.	FHW	A	C		B		A	C
100	Giving Denver Development test for child.	NP	A						C
246	Reviewing intake information on family, assessing priority of problems.	FHW	A			C		C	B
159	Follow up on no-show pt.,arrangg.new apt.	LPN-U	not in questionnaire						
238	Decidg.pt. needs homemkg.services; doing.	FHW	A	B		B	C	A	C
202	Give intro.info.on brth.con.meth.on ords.	LPN-U	A			B	C	A	B
124	Checkg. assessg.subords' attendance.	NP	not in questionnaire						
197	Reinforcg.prescribed diet, medication.	LPN-E	A	A		A	A	A	C
228	Teachg.TB pt.& family proper health practs.	FHW	B	B		A	A	A	C
221	Makg.oral present.on good hlth. practs.	FHW	B	B		A		A	B
255	Contribg.opinion at Unit conf.as Med.Asst.	MA-U	not in questionnaire						
258	Reinforcg.pt. in use of contraceptive.	MA-U	A			B	C	A	B
240	Decidg,arrang. apt.for pt.at Center.	FHW	not in questionnaire						
131	Assigning staff to treatment rooms.	LPN-U LPN-E	not in questionnaire						
261	Answerg. phone in Unit; takg. message.	MA-U	not in questionnaire						
253	Follow up on pt.discharged from hospital.	FHW	A	C		A		A	B
94	Assessing tine test after time lapse and following up on results.	NP	A			A	B	A	A
77	Monitorg.functions,work of X-ray dept.	X-ray	not in questionnaire						
234	Deliver med.to pt.,exp.how to take as ord.	FHW	not in questionnaire						
259	Taking partial history from patient.	MA-U	A			B		B	C
107	Teach pt.self exam,care of breasts.	NP	B			A	A	A	B
116	Deciding whether to provide patient with transportation.	NP FHW	not in questionnaire						
138	Noticing and reporting relevant patient symptoms to Dr.	LPN-U MA-U	A	A		A	A	A	A
247	Dec.wheth.fam.tht.mvd.stays w/Fam.H.Team.	FHW	not in questionnaire						
204	Providing orientation tour of facilities and procedures at Center.	LPN-U FHW	not in questionnaire						
211	Teachg. how to bathe and diaper infant.	FHW	A	A		A	A	A	C
254	Plang.a weekly work schedule for approval.	FHW	not in questionnaire						
215	Teaching how to prepare infant formula.	FHW	A	C		A	C	A	C
126	Aprove,change requisition forms of subord.	NP	not in questionnaire						

Figure 37. CURRENT EDUCATIONAL SOURCES FOR TASK SEQUENCES: FACTOR FOUR, SOCIAL SERVICE AND COUNSELING SPECIALTY (continued)
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Task Code No.	Abbreviated Name of Task	Current Titles[a]	Curriculum Location[b]					
			C	LPN	X	D-RN	A-RN	B-RN	MD
113	Giving general reassurance to any patient.	NP LPN-U LPN-E FHW MA-U	not in questionnaire						
216	Teachg.bottle feedg.,burping to new mother.	FHW	A	A		A	A	A	B
106	Teachg. pt. postural drainage technique.	NP	C	B		A	A	A	C
225	Checkg.pt.'s med.;hvg.old ones discarded.	FHW	A	C		A		A	B
208	Collectg. stool spec.; taking to lab.	FHW	not in questionnaire						

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[b] C = Center; LPN = LPN Program; X = Radiologic Technician Program; D-RN = Diploma RN Program; A-RN = Associate Degree RN Program; B-RN = Baccalaureate RN Program; MD = Medical School. Within columns, C = covers small amount of curriculum content; B = covers significant amount; A = covers all or most of curriculum content needed for task.

Figure 38. CURRENT EDUCATIONAL SOURCES FOR TASK SEQUENCES: FACTOR FIVE, PHYSICAL CARE AND TREATMENT SPECIALTY
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Task Code No.	Abbreviated Name of Task	Current Titles[a]	Curriculum Location[b]						
			C	LPN	X	D-RN	A-RN	B-RN	MD
28	Emergency life support care.	INT PED	B	B		A	C	A	B
37	Treatment of injuries.	INT PED	C	C		B		B	A
60	Spinal tap from pediatric patient.	PED				B			A
62	Bone marrow sample from pediatric pt.	PED				B			B
22	Respond to card.arrest call; providg.care.	INT	C		C	B			B
50	Takg.sample of amniot.fluid from preg.pt.	OB-GYN				B			C
30	Spinal tap from adult patient.	INT				B			A
32	Suturing lacerations.	INT PED		C		C			B
41	Cauterizg; cervical biopsy; polyps; IUD; retroflexed uterus: vaginal care.	OB-GYN	B			C			C
61	Drawing blood from pediatric pt.'s vein.	PED	C			B			A
91	Administering first aid in emergency.	NP FHW	B	C	C	A		A	B
31	Bone marrow specimen from adult patient.	INT				B			B
87	Evaluating or following routine prescribed treatment or care.	NP	C			C	C	A	A
12	Removing a wart from non-child patient.	INT							B
17	Determining if suspect EKG reading is true or artifact.	INT PED				C		A	B
19	Determining allergy to dye for IVP X-rays.	INT			C				C
34	Incising and draining abcess or boil.	INT PED				C			B
59	Removing large blunt object from pharynx.	PED		C		C			C
33	Removing sutures.	INT OB-GYN PED	B			C			A

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Figure 38. CURRENT EDUCATIONAL SOURCES FOR TASK SEQUENCES: FACTOR FIVE, PHYSICAL CARE AND TREATMENT SPECIALTY (continued)
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Task Code No.	Abbreviated Name of Task	Current Titles[a]	Curriculum Location[b]						
			C	LPN	X	D-RN	A-RN	B-RN	MD
250	Conducting routine neonate examination.	FHW	A	C		A	B	A	A
13	Setg.up,teachg.IV apparat.,non-child pt.	INT	C	C		A	B	A	A
5	Instill.portion of hysterosalpyngography.	RAD			C				C
105	Irrigatg,dressg.bandag.,wound,burn.	NP	A	A		A	A	A	A
171	Assessg. urgcy. for MD to see emerg. pt.	LPN-E	A	B		A	C	A	B
38	Remove foreign object from eye and/or ear.	INT				B		B	B
18	Drawing blood from non-child patient's vein.	INT NP	B			A			A
112	Teachg.diabetic med.or insulin injection.	NP	A	A		A	A	A	A
156	Cleaning, dressing, bandaging wounds as ordered.	LPN-U LPN-E	A	A		A	A	A	A
192	Assistg.in emergency by preparg.materials.	LPN-E	A	B		A	C	B	
167	Prepg.,admin.subcut.,intramus.inject on ord	LPN-E	A	A	C	A	A	A	B
133	Preparg.,admin.,explain subcutaneous or intramuscular injection as ordered.	LPN-U	A	A	C	A	A	A	B
251	Conducting routine exam of any pt. over six months of age.	FHW	A	C		B	C	A	A
57	Removg.foreign object from pt.'s ear.	PED				B		A	B
117	Irrigatg.and changg.indwelling catheter.	NP	B	C		A	A	A	B
143	Obtaining urine specimen from female using catheter.	LPN-U LPN-E	C	A		A	A	A	
92	Removing thread stitches if appropriate.	NP	B			C			A
119	Teachg.infant's formula,feedg.bathg.diaperg	NP	A	B		A	B	A	C
243	Takg,recordg.vit.signs;notify MD of abnorm.	FHW	A	C		B	C	A	A
232	Help any pt.needing assistance in walking.	FHW	A	A		A	A	B	
118	Teaching pt. irrigation of catheter.	NP	B	C		A	A	A	B
58	Preparing patient with foreign body in eye by applying dye strip.	PED	C			B		A	C
104	Admin.common range of motion exerc.on ord.	NP	B	C		A	A	B	B
109	Teachg.irrigation,change,care of colostomy	NP	A	B		A	A	A	C
218	Bandaging or changing bandage for minor wound as ordered.	FHW MA-U	A	A		A	A	A	A
191	Applying splint on orders.	LPN-E	C	C		A		A	B
179	Preparing intravenous bottle.	LPN-E	B	C		A	B	A	B
229	Chang. colostomy bag, irrigatg.on orders.	FHW	A	B		A	A	A	C
152	Administering prepacked smallpox vaccine on orders	LPN-U LPN-E	B			A		A	A
185	Assistg. in administ.of oxygen on orders.	LPN-E	B	B		A	C	A	C
210	Bathing any adult bedridden patient.	FHW	A	A		A	A	A	
215	Teaching how to prepare infant formula.	FHW	A	C		A	C	A	C
206	Examing,treatg.bedridden pt.for bed sores.	FHW	A	A		A	A	A	B

Figure 38. CURRENT EDUCATIONAL SOURCES FOR TASK SEQUENCES: FACTOR FIVE, PHYSICAL CARE AND TREATMENT SPECIALTY (continued)
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Task Code No.	Abbreviated Name of Task	Current Titles[a]	Curriculum Location[b]						
			C	LPN	X	D-RN	A-RN	B-RN	MD
163	Preparg.materials for special procedures.	LPN-U	A	C	A	A	C	A	
224	Decidg.to make an occupied bed and making.	FHW	A	A		A	A	A	
173	Preparing patient for suturing.	LPN-E	A	A		A	B	A	A
244	Teachg.temp.taking,care of thermometer.	FHW	A	B		A	B	A	B
199	Preparing patient and taking vital signs before Dr.'s examination.	LPN-U LPN-E MA-U	A	B	B	B	B	A	B
93	Applying prepackaged tine test for TB.	NP LPN-U LPN-E FHW MA-U	B			A	C	A	A
200	Applying hot or cold compress on Dr.'s orders.	LPN-U FHW	A	A		A	A	A	B
201	Giving cold water or alcohol rub on Dr.'s orders.	LPN-U MA-U	A	A		A	B	A	C
162	Irrigating ear with solution as ordered.	LPN-U LPN-E MA-U	A	B		A	A	A	C
142	Administering rectal medication as ordered.	LPN-U LPN-E	B	B		A	A	A	
95	Tablet or dipstick urine test.	NP LPN-U LPN-E FHW MA-U	B	A		A	A	A	A
96	Taking throat culture specimen; labeling.	NP LPN-U LPN-E FHW MA-U	A	B		A	B	B	A
205	Giving pt. enema on doctor's orders.	FHW	A	A		A	A	A	C
190	Assisting pt. to or from wheelchair.	LPN-E FHW	A	A	C	A	A	A	
194	Administerg. eye or ear drops on orders.	LPN-E	A	A		A	A	A	A
233	Teachg.pt.how to irrigate eye with water.	FHW	B	A		A	B	A	C
177	Treatg. pt.for ringworm on Dr.'s orders.	LPN-E	A	B		A	A	A	C
188	Applying cold towels or ice bath to patient for fever on orders.	LPN-E	A	A		A	B	A	C
209	Givg.alc.bath for fev.;report if no effct.	FHW	A	A		A	B	A	C
212	Assistg.any non-inf.pt.to bathe or shower.	FHW	A	A		A	A	A	
195	Applying eye patch on orders.	LPN-E	A	B		A	A	A	
187	Giving oral medication to patient.	LPN-E	B	C		A	A	A	B

Figure 38. CURRENT EDUCATIONAL SOURCES FOR TASK SEQUENCES: FACTOR FIVE, PHYSICAL CARE AND TREATMENT SPECIALTY (continued)
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Task Code No.	Abbreviated Name of Task	Current Titles[a]	Curriculum Location						
			C	LPN	X	D-RN	A-RN	B-RN	MD
189	Treatg.pt.for lice on orders by shampooing.	LPN-E	A	A		A	B	A	C
256	Adming.prepacked polio vaccine on orders.	MA-U	B	C		A	A	A	B
161	Weighing and measuring patient and recording.	LPN-U LPN-E MA-U	A	B		A	A	A	A
170	Assisting patient in dressing.	LPN-E	A	A	A	A	A	A	
198	Admin.oral med.,expl.effects on Dr.'s ord.	LPN-U	B	C		A	A	A	B
217	Preparg.food,feedg. non-infant patient.	FHW	B	A		A	A	A	C
213	Treating baby for cradle cap.	FHW	A	C		A	A	A	
166	Assembling suture materials as ordered.	LPN-E	A	A		A	B	B	
260	Preparing hypodermic on orders.	MA-U	A	A	C	A	A	A	C
180	Prepg.tray for drawing blood;writg.labels.	LPN-E	A	C	A	A	C	A	
181	Preparing tray for nasal packing.	LPN-E	A	C	A	A	C	A	
153	Assisting Dr. in medical exam with materials.	LPN-U MA-U	A	C	A	A	C	A	
193	Preparg.for bone marrow punct.on orders.	LPN-E	B	B		A	A	B	
183	Inducg.vomiting in pt.on Dr.'s ord.w/med.	LPN-E	A	A		A	A	B	
182	Preparg.pt.for gastric lavage,assisting.	LPN-E	A	A		A	A	A	
214	Shampooing patient with itchy scalp.	FHW	A	A		A	B	A	C

[a] Radiologist = RAD; Internist = INT; Obstetrician-Gynecologist = OB-GYN; Pediatrician = PED; Lead X-ray Tech. and X-ray Tech. = X-ray; Nurse Practitioner = NP; LPN-Unit = LPN-U; LPN-Emergency = LPN-E; Family Health Worker = FHW; Medical Assistant-Unit = MA-U; EKG Tech. = EKG; Dark Room Aide = DRA.

[b] C = Center; LPN = LPN Program; X = Radiologic Technician Program; D-RN = Diploma RN Program; A-RN = Associate Degree RN Program; B-RN = Baccalaureate RN Program; MD = Medical School. Within columns, C = covers small amount of curriculum content; B = covers significant amount; A = covers all or most of curriculum content needed for task.

It is interesting to note that these tasks factor together with other treatment tasks that are taught, and stand in hierarchical relation to other tasks which essentially involve Introductory Procedures. The suggestion is that diagnosis, which does not involve operational touching of the patient aside from examining him, is accounted for by medical school, and many treatment tasks which involve great immediate danger to the patient are not. However, since these latter tasks are heavily dependent on practice for their successful performance, it would seem warranted that specialties in such activities be developed which would provide early and continued clinical practice. Inspection of the other tasks of Factor Five suggest where to look for the candidates for these professional-level specialties. Throughout the nursing line the performers are called upon to "lay hands" on the patient, and a familiarity with such contact is built up out of long clinical experience. The conclusion is obvious. These are the sources for the specialties -- not that these performers are now ready, but that they could be made ready most efficiently with the proper educational sequences.

Factor Six

Comments similar to those dealing with Factor Five apply to Factor Six, to the extent that Factor Six includes several "treatment" tasks. In addition, several of the tasks of this factor are now taught in the medical school, but not in the other programs, while their actual level on the factor suggests that they could be taught earlier in an educational sequence. Tasks 15, 16 and 51, which involve inspection of slides for the presence of infectious organisms, are such tasks. (See Figure 39.)

Figure 39. CURRENT EDUCATIONAL SOURCES FOR TASK SEQUENCES: FACTOR SIX, SPECIALTY IN FEMALE CARE

Task Code No.	Abbreviated Name of Task	Current Titles[a]	Curriculum Location[b]						
			C	LPN	X	D-RN	A-RN	B-RN	MD
54	Participating in Ob-gyn physician conf.	OB-GYN	not in questionnaire						
52	Contributg.to Fam.Health Team as Ob-gyn.	OB-GYN	not in questionnaire						
43	Delivery of baby through vagina.	OB-GYN				C		C	A
42	Providg.fertility assist.for female pt.	OB-GYN	C				C	B	B
86	Prenatal exam of preg.pt.;reportg.abnorm.	NP		C		B	B	B	A
85	Providg.post-partum exam;evaluatg.cond.	NP		B		A	B		A
89	Assess condition of neonate, follow-up.	NP	A	C		A		A	A
50	Takg.sample of amniot.fluid from preg.pt.	OB-GYN				B			C
41	Cauterizg; cervical biopsy; polyps; IUD; retroflexed uterus: vaginal care.	OB-GYN	B			C			C
248	Conducting routine prenatal exam.	FHW				B	C	A	C
101	Counselg. in sex,contracept.,VD,abortion.	NP	A	C		C	C	A	A
84	Performing pelvic exam on adult female including specimens and follow-up.	NP	A	C		B			A
5	Instill.portion of hysterosalpyngography.	RAD			C				C
11	Routine pelvic exam on adult fem. pt.	INT	A	C		B			A
202	Givg.intro.info.on birth control on ords.	LPN-U	A			B	C	A	B
226	Givg.basic sex ed., contracep.,abort.into.	FHW	A	C		B		A	C
250	Conductg. routine neonate examination.	FHW	A	C		A	B	A	A
258	Reinforcg.pt.in use of contraceptive.	MA-U	A			B	C	A	B
249	Conductg. routine post-partum exam.	FHW		B		A	A	A	A
103	Measurg., fitg.diaphragm for female pt.	NP	A			C		A	B
51	Determine pres.of monilia fungi on slide.	OB-GYN							A
16	Examining a slide for gonococci.	INT PED							A
143	Obtaing.urine specimen from female using catheter.	LPN-U LPN-E	C	A		A	A	A	
15	Determining presence of trichomonas on slide.	INT OB-GYN PED							A
117	Irrigatg,changg.indwelling catheter.	NP	B	C		A	A	A	B
118	Teachg. patient irrigation of catheter.	NP	B	C		A	A	A	B
107	Teachg. pt. self exam, care of breasts.	NP	B			A	A	A	B

[a] Radiologist = RAD; Internist = INT; Obstetrician-Gynecologist = OB-GYN; Pediatrician = PED; Lead X-ray Tech. and X-ray Tech. = X-ray; Nurse Practitioner = NP; LPN-Unit = LPN-U; LPN-Emergency = LPN-E; Family Health Worker = FHW; Medical Assistant-Unit = MA-U; EKG Tech. = EKG; Dark Room Aide = DRA.

[b] C = Center; LPN = LPN Program; X = Radiologic Technician Program; D-RN = Diploma RN Program; A-RN = Associate Degree RN Program; B-RN = Baccalaureate RN Program; MD = Medical School. Within columns, C = covers small amount of curriculum content; B = covers significant amount; A = covers all or most of curriculum content needed for task.

Unassigned Tasks

The unassigned tasks indicate a good deal of overlap across educational programs, much of which is not warranted. Inspection of Figure 40 suggests that, aside from the laboratory tasks (which should be taught at lower levels and are not),much routine specimen taking, testing and preparation of materials is taught at many levels. The reason, of course, is that these curricula are not and never were designed to be continuous sequences. The apparent overlap is justified only when each program must be complete unto itself.

Figure 40. CURRENT EDUCATIONAL SOURCES FOR SELECTED TASK GROUPINGS UNASSIGNED TO FACTORS
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Task Code No.	Abbreviated Name of Task	Current Titles[a]	Curriculum Location[b]						
			C	LPN	X	D-RN	A-RN	B-RN	MD
	LABORATORY RELATED TASKS								
36	Examining blood slide.	INT PED				C			A
14	Evaluating a skin specimen slide for fungi.	INT PED							A
35	Examining spun-down urine sediment and supernate.	INT PED	C			B			A
139	Assessing results of tine test.	LPN-U LPN-E FHW MA-U	A			A	B	A	A
207	Testing plaster in home for lead; reporting positive finding.	FHW	A						C
172	Taking stool specimen: testing for blood.	LPN-E	C	C		A			A
141	Testing stool specimen for blood using tablet.	LPN-U MA-U	C	C		A			A
98	Obtaining clean catch urine specimen.	NP LPN-U LPN-E MA-U	A	A		A	A	A	B
108	Teaching patient reagent or dipstick urine test.	NP	B	A		A	A	A	A
140	Teaching how to do urine test using tablet.	LPN-U MA-U	B	A		A	A	A	A
155	Obtaining urine specimen; preparing for lab.	LPN-U MA-U	not in questionnaire						
97	Teaching or collecting specimen for pinworm test.	NP	A			A			A

[a] Radiologist = RAD; Internist = INT; Obstetrician-Gynecologist = OB-GYN; Pediatrician = PED; Lead X-ray Tech. and X-ray Tech. = X-ray; Nurse Practitioner = NP; LPN-Unit = LPN-U; LPN-Emergency = LPN-E; Family Health Worker = FHW; Medical Assistant-Unit = MA-U; EKG Tech. = EKG; Dark Room Aide = DRA.

[b] C = Center; LPN = LPN Program; X = Radiologic Technician Program; D-RN = Diploma RN Program; A-RN = Associate Degree RN Program; B-RN = Baccalaureate RN Program; MD = Medical School. Within columns, C = covers small amount of curriculum content; B = covers significant amount; A = covers all or most of curriculum content needed for task.

Figure 40. CURRENT EDUCATIONAL SOURCES FOR SELECTED TASK GROUPINGS UNASSIGNED TO FACTORS (continued)
p. 2 of 3

Task Code No.	Abbreviated Name of Task	Current Titles[a]	Curriculum Location[b] C	LPN	X	D-RN	A-RN	B-RN	MD
	LABORATORY RELATED TASKS (continued)								
147	Preparing patient for pelvic exam; preparing slides.	LPN-U LPN-E MA-U	A	C		A	B	B	
196	Giving patient enema kit and instructions for use.	LPN-E	not in questionnaire						
	MISCELLANEOUS TASKS								
80	Preparing materials for IVP-dye allergy test.	X-ray			A	C		B	A
230	Preparing materials for use in a catheter irrigation.	FHW	A	C	A	A	C	A	
	MACHINE RELATED AND HOUSEKEEPING TASKS								
135	Readying treatment room by wiping up and cleaning.	LPN-U LPN-E MA-U	B	C		A	C		
145	Preparing equipment for autoclave by washing and wrapping.	LPN-U	A	B	C	C			
175	Preparing equipment for autoclave by wrapping.	LPN-E	A	B	C	C			
178	Wrapping sterile equipment removed from sterilizer.	LPN-E	A	C	C	C	C		
149	Sterilizing equipment in hot water sterilizer.	LPN-U MA-U	A	C	C	C	C		
174	Washing and placing equipment in sterilizer.	LPN-E	A	C	C	C	C		
70	Preparing hand developing tank for X-ray film.	X-ray DRA			A				
2	Loading or unloading film in fluoroscopy machine.	RAD	none of programs						
268	Checking EKG paper and putting in a new roll.	EKG	B						A
72	Loading X-ray film cassettes.	X-ray DRA			A				
269	Deciding repair is needed for EKG machine.	EKG DRA	not in questionnaire						
267	Routine cleaning and dusting of machines.	EKG DRA	not in questionnaire						
223	Deciding to make an empty bed and making.	FHW	A	A		A	A	A	

Figure 40. CURRENT EDUCATIONAL SOURCES FOR SELECTED TASK GROUPINGS UNASSIGNED TO FACTORS (continued)
p. 3 of 3

Task Code No.	Abbreviated Name of Task	Current Titles[a]	Curriculum Location[b] C	LPN	X	D-RN	A-RN	B-RN	MD
	MACHINE RELATED AND HOUSEKEEPING TASKS (continued)								
69	Using automatic developer for X-ray and spot films.	X-ray DRA			A				
222	Duplicating forms on duplicating machine.	FHW	not in questionnaire						
144	Preparing hot water sterilizer for use.	LPN-U	A	C	C	C	C	C	
146	Setting autoclave.	LPN-U MA-U	A	B	C	C			
273	Turning on X-ray film developing machine.	DRA	not in questionnaire						

[a] Radiologist = RAD; Internist = INT; Obstetrician-Gynecologist = OB-GYN Pediatrician = PED; Lead X-ray Tech. and X-ray Tech. = X-ray; Nurse Practitioner = NP; LPN-Unit = LPN-U; LPN-Emergency = LPN-E; Family Health Worker = FHW; Medical Assistant-Unit = MA-U; EKG Tech. = EKG; Dark Room Aide = DRA.

[b] C = Center; LPN = LPN Program; X = Radiologic Technician Program; D-RN = Diploma RN Program; A-RN = Associate Degree RN Program; B-RN = Baccalaureate RN Program; MD = Medical School. Within columns, C = covers small amount of curriculum content; B = covers significant amount; A = covers all or most of curriculum content needed for task.

Note: Administrative tasks and most Inventory and Supply Related tasks were not in the questionnaire because their curriculum contents are obviously specific to the institution.

CHAPTER 5

PRACTICAL RESULTS OF PILOT TEST FOR IMMEDIATE CENTER USE

The pilot test was not only a test of the methodology; the specific content of the work is of relevance to the Dr. Martin Luther King, Jr. Health Center. The uses to which the results can be put are of three types: (1) recommendations that can be applied immediately without major restructuring of the jobs; (2) recommendations that require major restructuring of the jobs; and (3) recommendations that require a major rethinking of the role of the Family Health Team, as well as a major restructuring of jobs. Curriculum implications accompany each.

This chapter presents an analysis of the jobs studied at the Center and recommendations that can be applied to the jobs and to curricula without major reorganization. (Chapter 6 deals with type 2 recommendations and Chapter 7, on policy, includes a section on type 3 considerations.)

This chapter assumes that all the tasks which were identified in the pilot test are to be continued at the Center, and that no major additions or deletions of tasks is contemplated. It is known that some reassignment of tasks has taken place since the pilot test, but these are primarily the creation of a Nurse Coordinator whose functions involve the management and coordination of the Teams, and the use of Managers for each Unit at the Center.

Given the basic assumption listed above, the task data make it possible to examine the overall structure of jobs with respect to overlap tasks, and the levels of tasks in relation to the level of the titles in which the tasks appear. The data can point to the most likely job ladder possibilities, given the current titles and salary relationships.

This chapter also pinpoints several discrepancies in task or curriculum content at the Center and reports on the pilot test examination of curriculum overlap. It notes evidence warranting advanced standing in credentialed programs.

JOB TITLES AND OVERLAP

Theoretically, tasks which are adequately performed in lower-level job titles, or can be adequately performed at lower levels, are misallocated when they are also done by persons in upper-level titles. If an institution wishes to make better use of scarce and expensive upper-level manpower resources, such data are of relevance.

The HSMS task definition makes it possible to identify true task overlap and to avoid confusing overlap of elements with overlap of whole tasks. The importance of the overlap data for the Dr. Martin Luther King, Jr. Center is less due to acute shortages (although there is some scarcity of physician time) and more because of pressure to reduce operating costs. Misallocation of tasks can be expensive. The advantage of having overlap data is that, given acceptable performance of the tasks in currently overlaped titles, there is a *prima facie* argument for downward assignment of overlap tasks to the lower salary levels.

Overview

Figure 41 presents a summary of the task overlap data for the titles studied. (The two LPN titles are combined.) The titles are presented in descending order by maximum annual salary, and from left to right in the same order. Inspection of the Figure permits the reader to find the number and percentage of overlap tasks for each title and for the titles which share the overlaps.

There seems to be no overall problem of overlap; the overlap of tasks appears to be concentrated between pairs of titles. For example, overlap between the Internist and Pediatrician accounts for 53 percent of the Internist's tasks and 62 percent of the Pediatrician's tasks. The Nurse Practitioner has 17 percent task overlap with the Family Health Worker; the X-ray Technician has a 22 percent overlap with the Dark Room Aide; the LPN's overlap 31 percent with the Medical Assistant.

For some of the lower level titles, the bulk of their jobs are duplicated by upper level titles. For example, 44 percent of the Dark Room Aide's tasks are also done by the X-ray Technician; and 76 percent of the Medical Assistant's tasks are also done by LPN's.

While there is no major problem of overlap across many occupational levels or titles, there is the impression that better demarcations could be made among tasks of the Nurse Practitioner, Family Health Worker, LPN's and Medical Assistants.

Figure 41. DISTRIBUTION OF OVERLAP TASKS BY TITLE

Job Title	Number of Tasks (total of 273 unique tasks) Total	Total Overlap	Overlap by Title: Number, and Percent of Total for Row RAD	OB-GYN	INT	PED	NP	X-ray	FHW	LPN	EKG	MA-U	DRA
Radiologist	8	0											
Obstetrician-Gynecologist	21	5 24%			5 24%	4 19%							
Internist	30	18 60%		5 17%		16 53%	1 3%						
Pediatrician	26	16 62%		4 15%	16 62%								
Nurse Practitioner	46	10 22%			1 2%				8 17%	5 11%		5 11%	
Lead X-ray Tech., X-ray Tech.	18	5 28%							1 6%	1 6%		1 6%	4 22%
Family Health Worker	63	17 27%					8 13%	1 2%		6 10%	1 2%	7 11%	1 2%
LPN (Emergency Room and Unit)	83[a]	31 37%							6 7%		1 1%	26 31%	
EKG Technician	12	4 33%							1 8%	1 8%			2 16%
Medical Assistant-Unit	34	27 79%					5 15%	1 3%	7 21%	26 76%			
Dark Room Aide	9	7 78%						4 44%	1 11%		2 22%		

[a] LPN-Emergency: 53; LPN-Unit: 51. There are 21 tasks which overlap across the two LPN titles.

It is important to note that some overlap is inevitable, because certain administrative or related activities are needed for many titles due to the circumstances involved. For example, since the Family Health Worker functions in patients' homes, one would expect overlap with activities performed in the Center.

Detailed Data

Figure 42 presents the details of the task overlap data. The first set of tasks is classed as "assignable." This means that they probably can be assigned to fewer titles than is now current, or even to other titles than is now current. The second set of overlap tasks is classed as "difficult to avoid" due to the circumstances of their performance. It is not expected that these overlaps can be avoided.

The information in Figure 42 includes each task's code number, its abbreviated name, the titles in which it appears, the task factor to which it was assigned, its level, and its Frequency scale value for each title in which the task occurs. (Appendix B.3 presents the Task Frequency scale.) The tasks are arranged in descending order by their assigned HSMS levels.

The first five tasks in Figure 42 are found in professional and semi-professional titles. For most of these tasks it might conserve resources to eliminate overlap and concentrate the tasks in only one title. In the case of Factor Five tasks, which benefit from practice, this might even improve their performance.

Figure 42. OVERLAP TASKS BY TITLE, FACTOR, LEVEL AND FREQUENCY
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Task Code No.	Abbreviated Name of Task	Titles in which task is found: Title[a]	Factor[b]	Level[c]	Frequency[d]
	ASSIGNABLE OVERLAP				
20	Reading and interpreting "stat" X-rays on request.	INT	Three	5	4
		PED			6
115	Deciding on and arranging referral of patient to agency.	NP	Four	4	6
		FHW			9
34	Incising and draining abcess or boil.	INT	Five	4	1
		PED			4
33	Removing sutures.	INT	Five	4	2
		OB-GYN			3
		PED			3
17	Determining if suspect EKG reading is true or artifact.	INT	Five	4	3
		PED			6
18	Drawing blood from non-child patient's vein.	INT	Five	3	1
		NP			2
15	Determining presence of trichomonas on slide.	INT	Six	3	2
		OB-GYN			3
		PED			3
16	Examining a slide for gonococci.	INT	Six	3	2
		PED			2
14	Evaluating a skin specimen slide for fungi.	INT	U	3	2
		PED			4
35	Examining spun-down urine sediment and supernate.	INT	U	3	3
		PED			4
36	Examining blood slide.	INT	U	3	2
		PED			6
93	Applying prepackaged tine test for TB.	NP	Five	2	6
		LPN-U			8
		LPN-E			7
		FHW			3
		MA-U			7

[a] Radiologist = RAD; Internist = INT; Obstetrician-Gynecologist = OB-GYN; Pediatrician = PED; Lead X-ray Tech. and X-ray Tech. = X-ray; Nurse Practitioner = NP; LPN-Unit = LPN-U; LPN-Emergency = LPN-E; Family Health Worker = FHW; Medical Assistant-Unit = MA-U; EKG Tech. = EKG; Dark Room Aide = DRA.

[b] Factors are as follows: One = Surgery, Diagnosis, Prescription; Two = Pediatric Diagnosis and Prescription; Three = Machine Related Care and Radiology; Four = Social Service and Counseling; Five = Physical Care and Treatment; Six = Female Care; U = Unassigned to a factor.

[c] Levels are as follows: 7 = Surgery; 6 = Professional II; 5 = Professional I; 4 = Semi-professional; 3 = Technician; 2 = Assistant; 1 = Aide.

[d] Numbers refer to scale values of the Task Frequency Scale (B.3).

Figure 42. OVERLAP TASKS BY TITLE, FACTOR, LEVEL AND FREQUENCY (continued)
p. 2 of 4

Task Code No.	Abbreviated Name of Task	Titles in which task is found: Title[a]	Factor[b]	Level[c]	Frequency[d]
	ASSIGNABLE OVERLAP (continued)				
95	Tablet or dipstick urine test.	NP	Five	2	4
		LPN-U			3
		LPN-E			6
		FHW			4
		MA-U			6
96	Taking throat culture specimen; labeling.	NP	Five	2	4
		LPN-U			4
		LPN-E			7
		FHW			2
		MA-U			6
161	Weighing and measuring patient and recording.	LPN-U	Five	2	8
		LPN-E			6
		MA-U			8
162	Irrigating ear with solution as ordered.	LPN-U	Five	2	3
		LPN-E			6
		MA-U			1
199	Preparing patient and taking vital signs before Dr.'s examination.	LPN-U	Five	2	8
		LPN-E			8
		MA-U			8
201	Giving cold water or alcohol rub on Dr.'s orders.	LPN-U	Five	2	2
		MA-U			4
98	Obtaining clean catch urine specimen.	NP	U	2	4
		LPN-U			7
		LPN-E			7
		MA-U			6
139	Assessing results of tine test.	LPN-U	U	2	8
		LPN-E			7
		FHW			3
		MA-U			7
140	Teaching how to do urine test using tablet.	LPN-U	U	2	3
		MA-U			6
141	Testing stool specimen for blood using tablet.	LPN-U	U	2	1
		MA-U			6
157	Checking chart for entry of lab results.	LPN-U	U	2	8
		MA-U			8
71	Developing radiographs using hand developer.	X-ray	Three	1	3
		DRA			6
116	Deciding whether to provide patient with transportation.	NP	Four	1	3
		FHW			8
153	Assisting Dr. in medical exam with materials.	LPN-U	Five	1	3
		MA-U			7
69	Using automatic developer for X-ray and spot films.	X-ray	U	1	9
		DRA			8

Figure 42. OVERLAP TASKS BY TITLE, FACTOR, LEVEL AND FREQUENCY (continued)
p. 3 of 4

Task Code No.	Abbreviated Name of Task	Titles in which task is found: Title[a]	Factor[b]	Level[c]	Frequency[d]
	ASSIGNABLE OVERLAP (continued)				
70	Preparing hand developing tank for X-ray film.	X-ray	U	1	3
		DRA			4
72	Loading X-ray film cassettes.	X-ray	U	1	9
		DRA			9
97	Teaching or collecting specimen for pinworm test.	NP	U	1	2
		FHW			2
135	Readying treatment room by wiping up and cleaning.	LPN-U	U	1	8
		LPN-E			7
		MA-U			8
137	Delivering cultures and specimens to incubator or lab.	LPN-U	U	1	4
		MA-U			7
145	Preparing equipment for autoclave by washing and wrapping.	LPN-U	U	1	4
		MA-U			6
146	Setting autoclave.	LPN-U	U	1	6
		MA-U			6
147	Preparing patient for pelvic exam; preparing slides.	LPN-U	U	1	8
		LPN-E			7
		MA-U			6
149	Sterilizing equipment in hot water sterilizer.	LPN-U	U	1	6
		MA-U			6
151	Preparing treatment room by cleaning up and stocking supplies.	LPN-U	U	1	4
		MA-U			6
155	Obtaining urine specimen; preparing for lab.	LPN-U	U	1	7
		MA-U			8
160	Escorting patient within institution.	LPN-U	U	1	2
		MA-U			6
164	Filling out forms with ID information.	LPN-U	U	1	4
		MA-U			7
	OVERLAP DIFFICULT TO AVOID				
27	Lectures to staff and students on health and medical subjects.	INT	Two	6	2
		OB-GYN			2
37	Treatment of injuries.	INT	Five	6	1
		PED			6
28	Emergency life support care.	INT	Five	6	1
		PED	One	5	2
29	Informally instructing subordinates in patient care.	INT	Two	5	4
		PED			3
32	Suturing lacerations.	INT	Five	5	1
		PED			6
91	Administering first aid in emergency.	NP	Five	5	2
		FHW			2
24	Assessing urgency of follow up for no-show patients.	INT	Two	4	6
		OB-GYN			6
		PED			7

Figure 42. OVERLAP TASKS BY TITLE, FACTOR, LEVEL AND FREQUENCY (continued)
p. 4 of 4

Task Code No.	Abbreviated Name of Task	Titles in which task is found			Frequency[d]
		Title[a]	Factor[b]	Level[c]	
	OVERLAP DIFFICULT TO AVOID (continued)				
23	Filling in forms and letters describing pt.'s medical condition for institutions.	INT	Four	3a	6
		OB-GYN			6
		PED			7
26	Participating in committees at institution.	INT	Four	3a	2
		PED			6
203	Reinforcing diet and making ethnic substitutes.	LPN-U	Four	3b	3
		FHW			6
218	Bandaging or changing bandage for minor wound as ordered.	FHW	Five	3	3
		MA-U			4
190	Assisting patient to or from wheelchair.	LPN-E	Five	2	6
		FHW			4
200	Applying hot or cold compress on Dr.'s orders.	LPN-U	Five	2	2
		FHW			3
128	Deciding order for non-medicinal supplies.	LPN-U	U	2	4
		LPN-E			4
		EKG			2
113	Giving general reassurance to any patient.	NP	Four	1	8
		LPN-U			8
		LPN-E			9
		FHW			8
		MA-U			8
138	Noticing and reporting relevant patient symptoms to Dr.	LPN-U	Four	1	8
		MA-U			8
204	Providing orientation tour of facilities and procedures at Center.	LPN-U	Four	1	2
		FHW			2
75	Translating Spanish-English conversation.	X-ray	U	1	7
		LPN-U			7
		FHW			7
		MA-U			7
231	Deliver and/or pick up forms and supplies.	FHW	U	1	3
		EKG			6
235	Judging what supplies are needed and requesting.	FHW	U	1	8
		DRA			4
267	Routine cleaning and dusting of machines.	EKG	U	1	6
		DRA			6
269	Deciding whether repair is needed for machine.	EKG	U	1	2
		DRA			3

[a] Radiologist = RAD; Internist = INT; Obstetrician-Gynecologist = OB-GYN; Pediatrician = PED; Lead X-ray Tech. and X-ray Tech. = X-ray: Nurse Practitioner = NP; LPN-Unit = LPN-U; LPN-Emergency = LPN-E; Family Health Worker = FHW; Medical Assistant-Unit = MA-U; EKG Tech. = EKG; Dark Room Aide = DRA.

[b] Factors are as follows: One = Surgery, Diagnosis, Prescription; Two = Pediatric Diagnosis and Prescription; Three = Machine Related Care and Radiology; Four = Social Service and Counseling; Five = Physical Care and Treatment; Six = Female Care; U = Unassigned to a factor.

[c] Levels are as follows: 7 = Surgery; 6 = Professional II; 5 = Professional I; 4 = Semi-professional; 3 = Technician; 2 = Assistant; 1 = Aide.

[d] Numbers refer to scale values of the Task Frequency Scale (B.3).

The fact that the Family Health Worker does task 115, which is at Level 4, warrants further inspection. Either the task was overrated in job analysis, or the Family Health Worker is assigned above trained capabilities, or a disproportionate effort had to have been made to train for a task that should probably be reached at a later stage than the performer's title suggests. The fact that the task overlaps with the Nurse Practitioner suggests that the task may need to be redone by the Nurse Practitioner in any event and that there may be wasted time involved.

Tasks 18, 15, 16, 14, 35 and 36 all show overlaps, primarily among physicians' titles. None of the tasks are at a level which warrants their being assigned to physicians. These tasks may waste precious physician time and should either be reassigned to only one, less busy professional or should be given to a trained technician. It is not unusual to find physicians doing such laboratory work because they do not trust the competence of the technician. For a sensitive management, this should signal the need for better training, and not the assignment of such tasks to professionals.

The overlap in tasks 93, 95 and 96 does not seem to be justifiable. One could argue that these specimen takings and tests need to be done at home, in the Unit, and in the Emergency room, but it cannot be argued that they should be done by the Nurse Practitioner. This performer's Frequency scale values for these tasks are sufficiently high to suggest that the tasks be delegated because they waste too much of the Nurse Practitioner's time.