WorkKeys®

Job Profile Report

For the Registered Nurse Job

Jack Hughston Memorial Hospital
Phenix City, Alabama

December 12, 2011

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Executive Summary

Purpose

This job profile report presents the results of an ACT® WorkKeys® profile (job analysis) of the Registered Nurse (RN) job at the Jack Hughston Memorial Hospital (JHMH) site in Phenix City, Alabama. The profile was conducted by Chattahoochee Valley Community College's ACT authorized job profiler Debbie Woodham, to establish task lists and identify the WorkKeys skill levels necessary for selection into and effective performance of the RN job at JHMH. The results of this project and review of its findings will also help to inform JHMH's use of the WorkKeys system to improve the employee selection process for the RN job.

WorkKeys Job Profiling Procedure

WorkKeys job profiling is conducted by job profilers who have been trained and authorized by ACT Industrial/Organizational Psychologists. The profiling procedure is designed to systematically develop accurate profiles through a task analysis that is used to select the tasks most important to a job, and a skill analysis that is used to identify the on-the-job behaviors associated with the WorkKeys skills under consideration and to identify the skill levels necessary for entry and effective performance on the job (i.e., cut or passing scores).

Task Analysis

The first step in conducting the profile session was to develop a Final Task List showing the critical tasks of the job. Ms. Woodham first developed an Initial Task List using the Department of Labor's O*NET database, JHMH's job descriptions, resources from similar job profiles, information gathered from the tour of the facility, job shadowing, and interviews. Ms. Woodham toured JHMH 's Location facility with Melanie Yomes , Human Resources, on June 16, 2011. Ms. Woodham job shadowed on June 16 the following Registered Nurses: Anna Caldwell, Surgical RN; Freida Hicks and Chris Allen, Post Op RN; Pat Pattillo, ICU RN; and Carol Ann Youngstrom, ER RN for approximately five hours. RNs perform the functions of assessing, planning, implementing, and evaluating the care for the assigned patients on the unit during a shift. The RN is responsible for meeting all Standards of Practice, which includes managing all assigned personnel, supplies, and equipment on the unit, and for promoting collaboration with all members of the health care team and family members.

Ms. Woodham then met with two groups of Subject Matter Experts (SMEs) to tailor the Initial Task List to make sure that each resulting Final Task List accurately and completely described the job. Each group worked to develop one list. The job profiler met with the first group (Group A) of four SMEs on August 16, and met with the second group (Group B) of four different SMEs on August 17. The SMEs in each group worked to add, delete, consolidate, and change the descriptions of tasks, as needed, to make sure they accurately depicted their job as it is performed at their company. Then they independently rated each task in terms of its Importance. The average Importance rating

for each task was used to sort the task statements and list them in order, with the most important (or critical) tasks placed at the beginning of the list. Tasks that received an average rating of 2 (i.e., low importance) or lower were grayed out, italicized, and moved to the bottom of the list. The SMEs then reviewed the list to see the final order of the tasks. The Final Task List, with the tasks listed in order of Importance, can be found at the end of this report.

Skill Analysis

Each SME group completed a skill analysis to identify the on-the-job behaviors associated with the WorkKeys skills under consideration and to identify how the skills are used on the job. The SMEs reviewed four WorkKeys skills and determined that four are required: Workplace Observation, Locating Information, Reading for Information, and Applied Mathematics. The skills were considered one at a time, and the SMEs completed their discussion of one skill before going on to the next. The job profiler gave each SME a copy of the WorkKeys skill definition, read the definitions aloud, and then answered any questions the SMEs had. Once the SMEs understood the definition of a skill and had determined its relevance to the job, they independently identified the important tasks on their Final Task List that require the skill and explained how they use the skill to complete the identified task. For a task to be considered in the next step to set the skill level (i.e., cut or passing score), the majority of the SMEs had to agree that the task required the skill.

The job profiler then presented detailed descriptions of the WorkKeys skill levels to the SMEs (see Appendix B) which included examples of problems or situations employees deal with at each level. Next, the SMEs determined which skill levels are necessary at job entry and for effective performance. The profile results shown in Table 1 indicate skill requirements for job entry and the profile results shown in Table 2 indicate the skill requirements for effective performance. Following the *Uniform Guidelines on Employee Selection Procedures* (1978), entry into the RN job at JHMH was defined as an employee's first day in the job prior to working with a preceptor, completing informal (on-the-job) training or formal training. Employees should be expected to come into the job with the skills shown; they are not expected to learn these skill levels while in the job. The final entry-level skill requirements reported here are recommended as cutoff (or passing) scores on the WorkKeys assessments for entry into the job. Effective performance is the point at which an employee performs competently without continuous supervision. JHMH defines this as being when a RN has worked with a preceptor daily for three months, has completed on-the-job training for one year and has completed specialized formal training in areas such ER and ICU. This level of performance is typically achieved after one year of work in the role of RN. The final results shown in Table 2 indicate skill requirements for effective performance and may be used for training purposes.

The results of these sessions, with respect to the Applied Math, Locating Information and Reading for Information, were reconciled on September 6, 2011. During the reconciliation session, a representative sample of SMEs from both groups met to discuss

the differences in skill levels chosen and to reach consensus as to the appropriate skill levels required for the job.

Table 1. Entry – Level Skill Requirements for the Job

WorkKeys Skill	Skill Level Range	Group A	Group B	Final Entry Level
Applied Mathematics	3–7	4	5	5
Locating Information	3–6	3	4	4
Reading for Information	3–7	4	5	5
Workplace Observation	1–5	3	3	3

Table 2. Effective Performance Level Skill Requirements for the Job

WorkKeys Skill	Skill Level Range	Group A	Group B	Final Effective Level
Applied Mathematics	3–7	6	5	5
Locating Information	3–6	4	5	5
Reading for Information	3–7	6	6	6
Workplace Observation	1–5	4	4	4

Results and Recommendations

There are several issues to consider before using the skill levels established by the profile to set expectations for employees and potential employees in the RN job.

- The WorkKeys assessment scores should be used in conjunction with other criteria as determined by JHMH (e.g., interviews, employment history, application reviews) when making selection or other high-stakes employment-related decisions.

- JHMH is not required to administer WorkKeys assessments for all of the skills included in the profile. Administering WorkKeys assessments along with using other selection measures (e.g., structured interviews) for the screening of applicants into the profiled job should provide sufficient information. JHMH may want to consider administering assessments only for those skills most relevant to the job.

- For selection and promotion purposes, JHMH should consider using these WorkKeys assessments: *Workplace Observation, Locating Information, Reading for Information and Applied Math*. This recommendation is based on the number of important/critical tasks identified by the SMEs as requiring each skill. If JHMH would like to use different WorkKeys assessments, the profiler should be consulted regarding the number of important tasks associated with each related skill. The reasons for assessing individuals on those skills should then be documented.

- For training and development purposes, JHMH should consider using the following WorkKeys assessments: *Workplace Observation, Locating Information, Reading for Information and Applied Math.* Training on skills at the beginning of the list may provide more impact than training on skills at the end of the list because the skills at the beginning of the list are more relevant to performance of the job.

- If JHMH would like to use the profile results for hiring applicants at any additional locations, then JHMH should consider conducting one or more profile sessions across these locations. The purpose of this is to have adequate representation of incumbents and of the work performed at the additional location(s). If the job does not yet exist at a location (e.g., a new facility), but the jobs are anticipated to be the same (i.e., using similar equipment), then these profile results can be used for selection purposes until subject matter experts at the new facility become available. At that time, profiling should be conducted at the new facility to confirm that the job requirements are the same.

- The use of assessment scores for making decisions regarding reductions in force should be carefully considered. Use of actual measures of employee performance such as performance appraisal results and attendance records should be taken into account when making decisions of this nature.

- If the selection system does not yield enough qualified candidates, modification of the selection system or a component of the selection system may increase the size of the applicant pool. Recruiting efforts could be increased (e.g., by increasing advertising efforts to cover a larger geographic area), requirements of the job could be modified, or training could be adjusted to address skill gaps. If the job is modified, the profiler should be consulted to reevaluate the profile.

- For the WorkKeys assessments to be as useful as possible, their placement within the selection process should be considered carefully. In general, selection tools should be used in an order that allows the most economical and efficient measures to be placed at the beginning of the process. For example, if an employer's selection battery consists of (a) one-on-one interviews and (b) WorkKeys assessments, the employer may wish to administer the assessments prior to conducting interviews. One-on-one interviewing of candidates may take significantly more staff time, so administering assessments to groups of candidates first may be more efficient because it can reduce the number of interviews.

Section 1

User, Location, and Dates of Study

This job profile report presents the results of an ACT WorkKeys® job analysis of the Registered Nurse (RN) job at the Jack Hughston Memorial Hospital (JHMH) site in Phenix City, Alabama. The profile was conducted by Chattahoochee Valley Community College's ACT authorized job profiler Ms. Woodham.

Ms. Woodham met with the first group (Group A) of four subject matter experts (SMEs) on August 16, and met with the second group (Group B) of four different SMEs on August 17. The results of these sessions, with respect to the Locating Information, Reading for Information and Applied Math, were reconciled on September 6, 2011. During the reconciliation session, a representative sample of SMEs from both groups met to discuss the differences in skill levels chosen and to reach consensus as to the appropriate skill levels required for the job.

A. Setting

The focus of this study is on JHMH's RN job in Phenix City, Alabama.

B. Current Selection Procedures

To hire applicants into the RN job, JHMH JHMH receives applicants by way of the applicant stack (JHMH website), HR looks through the applicants to find those that meet the requirements, then looks at the most qualified applicants and chooses the top five and those applicants are called in for an interview. HR completes interview with applicant then passes the top three to manager for interview. The manager interviews and a selection is made. If the qualified applicant is not found, the process repeats.

As part of new employee orientation training, new employees receive training in the following areas:

- Clinical Orientation
  - Lab
    - Blood Culture Collection-Order of the draw
    - Critical Results/Critical Labs
    - Waive Testing
  - Accu-Check
    - Accu-Chek Test/ Skills Check off
    - POI Charging Demonstration
- Nursing Services
  - Do not use List
  - Suicide Risk Assessment
  - Patients Rights and Responsibilities
  - Newborn "Safe Haven"
  - Medication Dispensing
  - Patient Involvement
  - Special needs of the Dying Patient and Family
  - Pain Management
  - Organ Procurement
- Pharmacy
  - Anticoagulation therapy
  - Oral Chemotherapy Administration
  - Hours of operation, after hours procedure
- Infection Control
  - **CSI—Video**
  - CLABSI
  - MDRO's
  - SSI
  - CAUTI
  - Central Line Maintenance
  - Equipment Cleaning

    - Policies, Documentation, Educational Material
    - **One Needle One Syringe campaign--Video**
- Body Mechanics
    - Back Injury
    - Posture and body mechanics
    - Wheelchair and transfer safety
    - Cold Therapy- use and application
    - CPM use
- Med-Dispense
    - Log on password set up/Demonstrate use
- Core Competency Checks
    - Defibrillator/Crash cart/Broselow bags
    - Restraints
    - Buck's Traction/Trapeze set-up
    - KCI Wound Vac
    - Pain Management-PCA Pumps, Flow sheets, Order sets
    - Hospira Pumps-IV- PCA-Enteral Feeding
- **HMS**
    - Log on HMS
    - Log on Email
    - Clinical View/Patient Care
- **Patient Care Components**
    - Button descriptions and instructions
    - Assessments/Flow sheets
- **Patient Care Components-Continued**
    - Vital Signs/I&O
    - Care plans
    - Home Meds Documentation
    - Clinical History Profile (CHP)
- **Continued**
    - E Mar
    - Exit Care

JHMH anticipates adding WorkKeys assessments to this procedure.

C. Purpose of the Study

JHMH intends to implement the WorkKeys system, which includes the job profiling procedure documented here and the job-related WorkKeys skill assessments. The WorkKeys system is used to determine an individual's levels of proficiency in specific skill areas and to identify pools of qualified applicants who have achieved the levels of proficiency needed to perform a specific job, as determined through a job analysis using the WorkKeys job profiling procedure. JHMH can use the results of this study to support the inclusion of the WorkKeys assessments in the selection procedure for the RN job. The WorkKeys system can also be used to identify skill gaps among applicants and incumbents, and to design training to eliminate such gaps. JHMH may use the effective performance skill levels as training goals for the RN job.

A. Analysis of the Job Using the WorkKeys® Job Profiling Procedure

The WorkKeys job profiling procedure is a method of job analysis designed to help businesses identify the skills and the skill levels employees need in order to perform a particular job effectively. It also gives individuals a clear picture of the skill levels they need if they are to qualify for and be successful in the jobs they want. When combined with the assessments, instructional support, and reporting, job profiles allow employers to make appropriate hiring and training decisions and allow individuals to make appropriate decisions about jobs and identify areas they need to strengthen as they pursue their education and career goals. The WorkKeys job profiling procedure is designed to systematically develop accurate profiles through a task analysis that is used to identify the tasks most critical to a job, and a skill analysis that is used to identify the skills and skill levels required for entry-level and for effective performance of that job (i.e., cut or passing scores).

Ms. Woodham met with the first group (Group A) of four subject matter experts (SMEs) on August 16, and met with the second group (Group B) of four different SMEs on August 17. During the profile sessions, the groups developed task lists that accurately and completely describe the job. The SMEs reviewed four WorkKeys skills and determined that four are required: Workplace Observation, Locating Information, Reading for Information and Applied Math.

The results from the task analysis (including the development of the Final Task Lists) and the skill analysis (including the identification of the WorkKeys skills required for the RN job) are described in this section of the report. The discussion and identification of the appropriate skill levels are presented in Section 5 of this report. The SME demographic information for the profile and incumbent population totals for the job are provided below.

Job Status	Population	Group A	Group B
Incumbent	XX	4	2
Supervisor			2
Other			

Gender	Population	Group A	Group B
Female	XX	4	3
Male	XX		1

Racial/Ethnic Group	Population	Group A	Group B
African American/ Black, Non-Hispanic	XX	1	3
Caucasian/White, Non-Hispanic		3	
Cuban			1

Age	Group A	Group B
Average	49	37
Highest	60	48
Lowest	42	28

Years in Profiled Job	Group A	Group B
Average	9	6
Highest	13	9
Lowest	6	2

Years with Company	Group A	Group B
Average	4	1
Highest	5	2
Lowest	2	1

B. A Complete Description of the Work Behaviors and Their Associated Tasks

Creating an Initial Task List

To profile the job, the job profiler first developed a comprehensive Initial Task List using the Department of Labor's O*NET database, JHMH's job descriptions, resources from similar job profiles, and information gathered from a tour of the facility.

Conducting the task list review

To develop the Final Task List, the job profiler met with the SME groups to edit the Initial Task List to make sure the task statements accurately and completely described the work required of incumbents. The SMEs then evaluated each task on the task list in terms of its Importance. The average Importance rating for each task was used to sort the task statements and list them in order, with the most important tasks placed at the beginning of the list. The SMEs then reviewed the list to see the final order of the tasks. The Final Task Lists are shown at the end of this report.

C. Method of Determining the Measure of Importance

Importance refers to the significance of the task to overall job performance. The SMEs are asked to consider what may happen if the task is not performed properly (excluding the effect of gross negligence or intentional sabotage). Each SME is asked to rate each task on a 6-point scale from 0 (This task is not performed) to 5 (This task is critical/extremely important to the job I perform). The Importance Rating Scale shown below is given to the SMEs when they make their Importance ratings. The average Importance rating for each task was used to sort the task statements and list them in order, with the most important tasks placed at the beginning of the list. Tasks that received an average rating of 2 or lower were grayed out, italicized, and moved to the bottom of the list. The SMEs then reviewed the list to see the final order of the tasks.

Importance Rating Scale	
Step 1	Read each task statement.
Step 2	If the task is NOT performed as part of your job, write a zero (0) in the box next to the task statement. If the task is performed as part of your job, think about how important the task is to your job. Importance refers to the significance of the task to overall job performance. In evaluating Importance, consider what may happen if the task is not performed properly. (Exclude the effects of gross negligence or intentional sabotage.)
Step 3	Choose the Importance statement that best describes how important the task is to your job. Write the number of that Importance statement in the box next to the task statement.
Importance Level	
0	This task is not performed.
1	This task is not very important to the job I perform.
2	This task is of low importance to the job I perform.
3	This task is important to the job I perform.
4	This task is very important to the job I perform.
5	This task is critical/extremely important to the job I perform.

D. Collecting Data and Calculating Ratings for the Work Behaviors

After carefully examining and editing the Initial Task List, the SMEs rated each task according to its Importance. The average Importance rating was used to sort the tasks, placing the most important tasks at the top of the list. The SMEs then reviewed the list to see the final order of the tasks. The Final Task Lists are shown at the end of this report.

E. Operational Definitions of the WorkKeys Skills

The WorkKeys skill definitions are provided in Appendix B.

F. Method Used to Determine the Relationship Between Each of the Skills and the Tasks Required on the Job

The SME groups completed a skill analysis to identify the on-the-job behaviors associated with the WorkKeys skills under consideration and to describe how the skills are used on the job. The skills were reviewed one at a time, and the SMEs finished the analysis for one skill before going on to the next. The job profiler gave each SME a copy of the WorkKeys skill definition, read the definition aloud, and then answered any questions the SMEs had. Once the SMEs understood the definition of a skill and had determined its relevance to the job, they independently identified the important tasks (i.e., those tasks that received ratings of 3/important or higher) on their Final Task List that require the skill. Then, the SMEs discussed how they use the skill to complete the identified task. Based on this discussion, the job profiler documented the Important/Critical tasks for which a majority of the SMEs agreed that the skill is required for task performance.

G. Relationships Between Each of the Skills and the Final Task Lists for the Job

The WorkKeys skills are presented in order, from those most important to job performance to those least important.

Workplace Observation

The WorkKeys Workplace Observation skill is an employee's skill in visually observing a workplace event, noticing details, and remembering instructions, procedures, processes, and demonstrations in order to generalize to workplace situations that may be similar or very different from what was observed.

The two groups of SMEs indicated that Workplace Observation skills are used to perform 99% (Group A) and 90% (Group B) of the critical tasks on their Final Task Lists, respectively. The SMEs identified that the Workplace Observation skills are used primarily in three key areas of their work: 1) Assessment and Documentation of Patient Condition, 2) Patient Care and 3) Environmental/Safety Procedures.

RNs use the Workplace Observation skill when they interact with patients following/applying medication administration knowledge to complete critical patient procedures/steps for confirming the right patient, correct drug to be given, proper dosage, accurate time allocation for drug infusion, and watching for possible drug reactions occurring in patient during infusion including any extended side effects.

Workplace Observation skills are used extensively when monitoring all aspects of patient care. RNs must observe the level of physical activity patients are engaging in, the medications they are consistently taking, their eating habits, levels of diet and nutrition

intake vs. requirements and then modifying patient treatment plans as indicated by patient responses and conditions.

RNs must monitor their work environment using Workplace Observation skills to watch for routine/crisis situations occurring with patients that require them to apply instructions/steps learned in order to distinguish activities from results and take the steps necessary to get the desired outcomes. They may also observe other healthcare professionals, patients and family members as interactions take place with patients to gain insight into how to apply leadership skills to given situations that require them to monitor the accuracy of others' work/involvement with the patient and provide directives and input into improved approaches/plans of care for individual patients.

RNs must follow instructions learned regarding established protocol for adhering to safety procedures when completing work tasks by wearing proper PPE according to directives given. They must also follow and observe that others are taking the required steps for reporting/documenting accidental exposure/contamination and following up according to set procedures they have been trained to follow.

Locating Information

WorkKeys Locating Information is the skill people use when they work with workplace graphics such as charts, graphs, tables, forms, flowcharts, diagrams, floor plans, maps, and instrument gauges. Employees use this skill when they find information in a graphic or insert information into a graphic. They also use it when they compare, summarize, and analyze information found in related graphics.

The two groups of SMEs indicated that WorkKeys Locating Information skills are used to perform 73% (Group A) and 51% (Group B) of the critical tasks on their Final Task Lists, respectively.

RNs use locating information skills to complete a wide-variety of daily tasks as part of their job. The locating information skill is used when applying medications to patients by checking the medical sheet to find out pertinent information regarding right patient, drug, route, dose, time, indications, drug interactions and side effects. They must also complete an occurrence report when the wrong drug has been administered to a patient. RNs also use locating information skills when maintaining a safe environment for patients and workers with regard to infection control issues and procedures because they must navigate to various computer programs to look up labs and CTs as well as physicians dictations on a patient. This lab work includes complicated charts which include ranges and values that must be located and considered in patient care plans. When planning patient care, RNs must develop a care plan using specific forms such as patient assessments, treatment plans and discharge planning forms. They must create the care plan using information from labs and ABGS and create charts that include such information as pain control involving medicine relief timing, tissue profusion involving wound showing signs of healing and mobility referencing the ability to ambulate with little assistance.

When documenting changes in patient conditions, RNs must use the locating information skill to file admission assessments, develop nursing care plans, populate flow sheets, file medical administration records, make nurse notes, define meds, identify allergies, clarify home meds all as a part of comprehensively charting patient information.

When planning transfusions, RNs must check physician's orders in medical charts, locate information on the blood type needed and make verifications using charts, forms and labels. Patient blood consent forms must be reviewed, patient charts must be updated, progress notes must be inserted and patient arm/blood bands must be checked.

In addition, when completing basic work forms the locating information skill is used to document a variety of information based on what the person is coming in with and what they need. For instance, RNs may need to document transfusions, populate specimen log books, file a clinical institute withdrawal assessment for alcohol, and non-DKA insulin protocol forms as appropriate.

The following is a representative list of the types of graphics and forms RNs use when applying the Locating Information skill on their jobs:

- Admission Assessments
- 24 (Care Plan) Hour Flow Sheets
- Medical Administration Records
- Patient Consent Forms
- Progress Notes
- Arm/Blood Bands
- Specimen Log Books
- Clinical Institute Withdrawal Assessments for Alcohol
- Non-DKA Insulin Protocol Forms
- Occurrence Reports
- Discharge Planning Forms
- Medical Sheets
- Home Meds Reconciliation
- Intake and Output Flow Sheet (INO)
- Nursing Care Plan
- Billable Charge Sheet
- Patient Control Anesthesia
- Heparin Protocol Form/Graph
- Equipment Monitors/Display Screens

Reading for Information

WorkKeys Reading for Information is the skill employees use when they read and use written text in order to do a job. The written texts include memos, letters, directions, notices, bulletins, policies, and regulations. It is often the case that these workplace communications are not necessarily well written or targeted to the appropriate audience. Reading for Information materials do not include information that is presented graphically, such as in charts, forms, or blueprints.

The two groups of SMEs indicated that WorkKeys Reading for Information skills are used to perform 22% (Group A) and 49% (Group B) of the critical tasks on their Final Task Lists, respectively.

RNs use the Reading for Information skill when applying leadership skills and serving as a resource for peers and other healthcare professionals. In these circumstances, they may need to refer to and interpret documents such as hospital policies and procedures in order to solve problems and deal with routine/crisis situations according to set standards. The Reading for Information skill is also used when interpreting patient data and applying required medications to patients. In these cases, they would need to read and interpret documents such as consents, history and physical records on patients, drug interaction procedures, x-ray and lab reports, diagnostic tests, physician's progress notes and more. To ensure safety and environmental regulations are met. RNs must use the Reading for Information skill to follow policy on how to wear proper PPE. They must also read documents on how to handle infection control issues in order to follow protocol for reporting and documenting exposures/contaminations. When handling patient discharge, RNs need to be able to interpret information in the discharge information paperwork in order to explain it to the patients. RNs also use Reading for Information skills when promoting health improvement programs by instructing individuals, families and other groups on topics such as health education, disease prevention and childbirth which requires them to read extensive documentation on various health topics and interpret/explain this information in educational forums.

The following is a representative list of the types of documents RNs must read when performing the job:

- Patient Medical Records
- Drug Interaction Procedures
- X-Ray Reports
- Physician Progress Notes
- Pathophysiology Reports
- Equipment Manuals (Pumps, Glucometers, PCs)
- Training Manuals
- Hospital Policies and Procedures
- NCLEX (Nurse Certification License Exam)
- Infection Control Procedures
- Discharge Paperwork
- Patient Consents
- Health Education Documents
- Medical Textbooks
- Education Journals

Applied Mathematics

WorkKeys Applied Mathematics is the skill people use when they use mathematical reasoning and problem-solving techniques to solve work-related problems.

The two groups of SMEs indicated that WorkKeys Applied Mathematics skills are used to perform 9% (Group A) and 47% (Group B) of the critical tasks on their Final Task Lists, respectively.

Registered Nurses use Applied Math skills when completing tasks such as administering medicines to adjust dosages for patients, when estimating how much medicine to infuse in a set period of time, when calculating how much medicine has been given and how much remains to be given in order to document medications administered in flowsheets. RNs also use Applied Math skills when addressing patient health issues. For example, to ensure a patient meets nutritional requirements and fluid intake, they may need to calculate how much water a patient is drinking versus the levels of fluid retention and loss. When maintaining updates on bed boards, census and assignment RNs use Applied Math skills when they must check the Operating Room schedule against existing patient census. This means they must calculate the number of beds available vs. number of beds needed. RNs must also maintain the number of nurses for each given area of the hospital such as monitoring the number of surgical nurses, discharge nurses, ICU nurses which involves Applied Math.

A representative example of RNs using Applied Math would be as follows:

Given a Dosage of (500mg), Weight of (200lb), and Time of 1 hour, first convert pounds to kilograms by dividing the body weight by 2.2: 200/2.2=90.90 kilograms. This gives the amount of medicine to be given to the patient with a body weight of 200 pounds. The RN must then calculate how much can be infused using IV Piggy Backs per minute by calculating the following: Convert 1 hour to 60minutes/90.90kg = .66kg can be infused per minute.

Skill definitions and skill levels

The Final Task Lists for the RN job are shown at the end of this report. The mean Importance ratings and skill requirements are also shown. A checkmark in a skill column means that, according to the SMEs in the profile session, the task in that row requires that skill. Tasks shown in gray italics are of low importance (i.e., they received averages ratings below 3) and they did not influence the skill levels set for the profile. The skill and skill level definitions are shown in Appendix B. WorkKeys terms are defined in Appendix C.

A. Title, Form, And Publisher

Titles and Forms

ACT recommends using individual assessments as specified in the Executive Summary. Representative titles and forms are listed in the table below, but are updated regularly. ACT Customer Service has information on current forms at all times.

Titles and Forms

WorkKeys Assessment	Paper and Pencil	Internet	Spanish
Applied Mathematics	G51-60BG, E10BF	E21BC, F22BC, G22BC	H11BB, H11BH
Applied Technology	G20FG, G14FF	F21FC, G21FC	H11 FF
Business Writing	D35-39CB	H01BW, J01BW	
Listening and Writing	B11CC, A10CC		
Locating Information	F10-19DF, E10-19DG	E21DC, F22DC, G21DC	H10DD
Observation	A10II, B11II		
Reading for Information	E40-49AF, G10AE	F21AC, D21AC, E22AC	H11AA
Teamwork	A01EE, C10EE		
Workplace Observation		A01WO, B01WO	

Publisher

ACT, Inc. with its headquarters in Iowa City, Iowa.

B. Validity In General

When the word "validity" is used in a testing context, it frequently refers to the three-part model of validity: content validity, construct validity, and criterion-related validity (Guion, 1980). Most of what has been written and reported with respect to the valid use of test scores has used these three concepts. Almost every measurement textbook uses these concepts as the basis for its organizational structure (Anastasi, 1982; Hopkins, Stanley, &

Hopkins, 1990), and they are a central feature of the *Uniform Guidelines on Employee Selection Procedures* (1978): "For the purposes of satisfying these guidelines, users may rely upon criterion-related validity studies, content validity studies, or construct validity studies" (CFR 41, 60-3).

The *Standards for Educational and Psychological Testing* (AERA, et al., 1999) uses these concepts when it describes methods of collecting data for validating the uses of test scores, but it describes validity as a unitary concept supported by evidence. Instead of focusing on types of validity, it discusses the same concepts in terms of the accumulation of validity evidence. *The Principles for the Validation and Use of Personnel Selection Procedures* (SIOP, 2003) also embraces this view. So while the *Guidelines* talks about "criterion related validity," the *Standards* talks about "evidence based on relations to other variables" (p. 13). While the *Guidelines* talks about "content validity," the Standards talks about "evidence based on test content" (p. 11). And when it comes to "construct related validity," the *Standards* explains that this is established by "the validity argument" (p. 184), which is "an explicit scientific justification of the degree to which accumulated evidence and theory support the proposed interpretation(s) of test scores" (p. 174). Evidence may be accumulated in a number of ways. What is relevant is that validity is established as a whole. The value of each way of collecting evidence is determined by its appropriateness to the situation, not by any inherent value of its own.

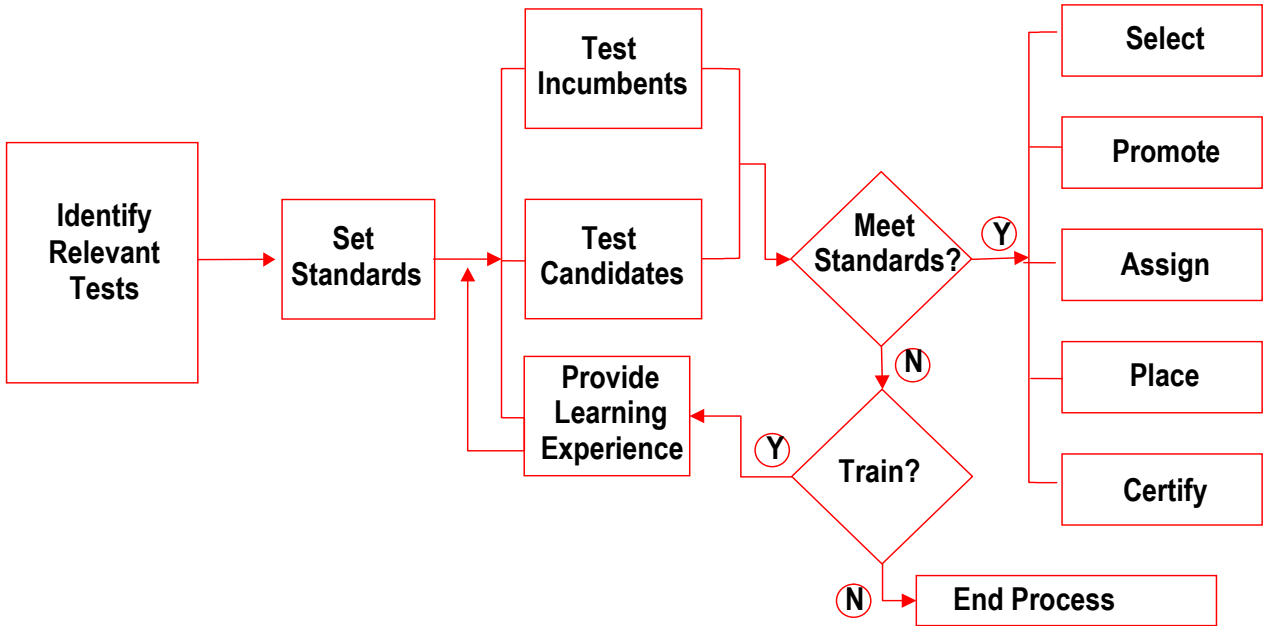
The *Standards* (pp. 9–11) explains that the need for validity evidence is based on the assumption that a test is going to be used for a purpose, and it is necessary to provide evidence showing that it is appropriate to use the test for that purpose. When a test is administered and a score is reported, it is necessary to determine what the score means within the context in which it is being used. This is done by accumulating evidence that shows what the test score means. Validity refers to the degree to which the evidence supports the interpretation of the scores. This is what is validated, not the test itself. Therefore, the validation process begins with a statement of what the score is expected to indicate and an explanation of how it will make that indication. Validation is achieved when a scientifically sound validity argument has been presented. Such an argument is one that supports the intended interpretation of the test scores by showing what they mean within a specific context. The validation process is unitary in that when the evidence is collected and analyzed, the results will be described in terms of one concept, "validation," and not in terms of the three concepts mentioned above. Any or all of the three may be used as evidence, but none should be viewed as an end in itself. In this, the *Standards* differs from the *Guidelines*, the requirements of which can be met by establishing validation using any one of the three types of validity it specifies.

Different uses of the WorkKeys system

Education and businesses can use WorkKeys scores for a variety of purposes. For example, potential educational uses of WorkKeys scores include identification of proficiency status, identification of educational needs, program evaluation, certification, and guidance and vocational counseling. The examinees in this setting include learners of all kinds in settings such as general education, vocational education, college preparation, and special

certification programs. Potential business score uses include identification of training needs, training program evaluation, certification, and selection of individuals to be hired, promoted, or transferred. The examinees in this setting include a wide range of potential job applicants as well as incumbent employees. These individuals may range greatly in such characteristics as age, socioeconomic status, language background, and educational history. Specifically, the WorkKeys scores can be used by education and businesses as support for their decisions. The figure below provides a depiction of how the WorkKeys system can be used to provide a rationale that supports a variety of judgments made with the assessments. Essentially, the figure illustrates the process from identification of which tests to use, to setting standards of test performance, administration of the tests to examinees, and making decisions based upon whether or not the individuals meet the standards. For example, assume that a business is interested in using the WorkKeys tests for selection of applicants into a job. To begin, they identify the WorkKeys skills that are required for the job (identify relevant tests) as well as the required level of performance of that skill (set standards) using the results of a job profile. Then, using the WorkKeys tests for the required skills, the employer administers tests to job candidates and compares the scores to the standards set by the profile. Candidates who meet the standard may be selected for employment, or if the selection system were structured in hurdles, the employer would move the candidates to the next stage of the selection process. Candidates who do not meet the standards would be removed from the employment selection process and could be referred to an organization that provides skill remediation.

Using The WorkKeys System for Decision-Making Support



C. WorkKeys Content Validity Evidence

When developing personnel programs such as selection procedures, it is important to establish that they are appropriate to use for this purpose. Validation is the process of collecting evidence to demonstrate that an employment selection procedure is related to the context of the job. The WorkKeys system primarily uses a content validation strategy. A selection measure has content validity when evidence shows that it representatively samples the important aspects of the job for which the measure will be used. The use of WorkKeys assessments, as specified in the Executive Summary, has been validated in accordance with the EEOC's *Uniform Guidelines on Employee Selection Procedures* (1978).

According to the *Standards*, important validity evidence can be obtained from an analysis of the relationship between a test's content and the constructs it is intended to measure. Test content includes themes, wording, and the format of the items, tasks, or questions on the test (p. 11). Each WorkKeys assessment has been built by first defining a hierarchical skill scale and then creating test items to be representative of both the skill area and each skill level within that skill area. This process is described below.

Selection of skills

In developing the WorkKeys system, ACT consulted with employers, educators, and labor organizations to develop a list of generalizable workplace skills that are used in a wide range of jobs, are teachable in a reasonable period of time, and facilitate job analysis (ACT, 1992). In 1992, the initial WorkKeys skills were selected on the basis of a review of the literature relating to employer-identified skill needs (Agency, 1989; ACT, 1987; Bailey, 1990; Carnavale, Gainer, & Meltzer 1990; Center, 1990; Conover, 1991; Educational Testing Service, 1975; Electronic Selection Systems, 1992; Greenan, 1983; SCANS, 1990) and a survey of employers and educators who participated in the design of the WorkKeys system. The latter were from seven states (Illinois, Iowa, Michigan, Ohio, Oregon, Tennessee and Wisconsin) and a network of community colleges in California. They assisted in the design and review of plans and materials and provided examinees for the prototype and field-test phases of assessment development. Twelve skills were selected for initial development based on those identified by educators and employers (McLarty, 1992). It was anticipated that this list would be modified over time in response to changing employer needs.

ACT released the first WorkKeys assessments, *Applied Mathematics*, *Reading for Information*, *Listening*, and *Writing* in 1992. *Applied Technology*, *Locating Information*, and *Teamwork* were released the next year, followed shortly by *Observation*. The *Business Writing* assessment was released in 2002; *Workplace Observation* was released in 2009. New items are generated and new forms are released periodically. In response to changing employer demands, ongoing development of new skill areas has continued over the years.

Skill scale development

In assessment development, it is common for the assessment to be developed first and for the development of score scales to follow (Crocker & Algina, 1986; Nunally & Bernstein, 1994). This is necessary for any score scale that depends on examinee data for its construction (e.g., norm-referenced score scales) because in that case, the skill scale and score scale are necessarily identical. Each WorkKeys skill scale can be conceptualized as an independent definition of the construct to be measured, a definition that is not based on the psychometric characteristics of the assessment. The score scales reflect the characteristics of each assessment and can be evaluated with respect to how well the assessment scores represent the designated skills and skill levels. More than one assessment approach can conceivably use the same skill scale. In the development of the WorkKeys system, the need to link job analysis with the assessment of individuals argued for separating the skill scales from the score scales so that both assessment of jobs (job profiling) and the assessment of individuals could be described by the same set of skill scales. It was therefore necessary to develop the skill scales before developing the tests and their score scales.

Several skill scale criteria were identified by WorkKeys staff as critical for the operational system (McLarty, 1992). WorkKeys skill levels would have to (a) be readily interpretable as a description of what the examinee can do and of the skills required by the job; (b) be appropriate for large-scale use and for validation as part of a system for selecting qualified job applicants; and (c) provide information that could be useful to a person wishing to improve skills in order to meet job requirements, an educator or trainer wishing to assist people in improving their job-related skills, and an employer wishing to select well-qualified employees. A primary goal was that the skill scales should be able to communicate to test takers, teachers, trainers, employers, labor union leaders, and other audiences, the levels of a generalizable skill that a job requires and that a person possesses. Based on their content, the WorkKeys skill scales would have to communicate clearly and concisely to people making decisions using the assessment results.

The WorkKeys skill scales are, therefore, intentional scales, created to ensure that the resulting score scales will be both meaningful and hierarchical. Cognitive and content-related aspects of a skill are analyzed to identify and combine their component strands in order to generate hierarchical scales that will be meaningful to individuals, educators, and employers. Aspects of content knowledge and cognitive skills that do not contribute to the hierarchical scale are excluded from it. The quality of the resulting skill scales is then judged by the degree to which they serve as a common metric to link the job analysis to the assessments and by their usefulness in identifying the skill levels required by jobs and possessed by individuals. Clustering approaches (identifying skills perceived as different but equally valuable) are intentionally excluded from the scale-building process, although such clusters could become the basis of separate skill scales.

Thus, the WorkKeys skill levels are designed to be standardized, but particular to each skill. That is, Level 6 in *Reading for Information* is not the same as Level 6 in *Locating Information*. Level 6 in *Reading for Information* does, however, mean the same skill level whether it is used to describe a job or a person, just as Level 6 in *Locating Information*

means the same thing when it is an individual's assessment score that it means when it is part of a job profile. The common metric, then, forges a link between assessments results and job analysis, but does not refer to any relationship between the skill areas.

Currently, ten WorkKeys assessments are available for operational use: Applied Mathematics, Applied Technology, Business Writing, Listening, Locating Information, Observation, Reading for Information, Teamwork, Workplace Observation, and Writing. In defining the basic or foundational skill domain to be covered in each WorkKeys assessment, ACT applies the following criteria:

- The way a skill is assessed is generally congruent with the way the skill is used in the workplace.
- The lowest level assessed approximates the lowest level for which an employer would be interested in setting a standard.
- The highest level assessed approximates the level beyond which specialized training would be required.
- The score scales are designed to have practical value in documenting workplace skills.
- The assessments are sufficiently reliable for high-stakes decision making such as selecting candidates for jobs.
- The assessments can be validated against empirical criteria.
- The assessments are feasible with respect to cost, administration time, and complexity.

The development process for a WorkKeys assessment consists of five phases: skill definition, test specification development, prototyping, pretesting, and construction of operational forms.

Phase 1: Skill Definition. Working with an expert panel of employers and educators, ACT first defines the content domains and develops hierarchical WorkKeys skill descriptions. The panel is asked to develop a broad definition of a skill area and to identify the lowest and highest levels of the skill to be measured. The panel then identifies examples of tasks within this broadly defined skill domain and narrows that domain to those examples that are important for job performance across a wide range of jobs. Next, the tasks are organized into subtasks (sometimes called "strands"), which are aspects of the general skill domain or skill area to be measured. The subtasks assessed in *Reading for Information*, for example, include "choosing main ideas or details," "understanding word meanings," "applying instructions," "and applying information and reasoning."

Each subtask is also divided into levels based on the variables thought to make it more or less difficult. In general, at the lower levels of difficulty, the employee has few variables to attend to. However, at the higher levels of difficulty, the employee must be able to process

information to apply it to more complex situations. For example, at the lower levels of the subtask "applying instructions" in *Reading for Information*, the employee need only apply instructions to clearly described situations. At the higher levels, however, employees must not only understand instructions in which the wording is more complex, meanings are more subtle, and multiple steps and conditionals are involved, but they must also apply these instructions to new situations.

Phase 2: Test Specification Development. Using the skill definitions developed in Phase 1 for multiple-choice tests, the ACT WorkKeys development team prepares test specifications, which detail the skills the assessment will measure and how the items will become more complex as the skill levels increase. Each level is defined in terms of its characteristics, and exemplar multiple-choice items (test questions) are created to illustrate it. Each item is comprised of a stimulus, a stem, and a set of response options. A stimulus may be a recorded voice, reading passage, video scenario, described situation, or one or more graphics, depending on the test. The stem is the part of the item for which an answer, or response option, must be selected. In most cases the complexity of the stimulus and the stem determines the skill level to which a particular test item is assigned.

Several WorkKeys assessments use a constructed-response (essay) format that follows similar prompt development steps. For the WorkKeys *Listening* and *Writing* assessment, the WorkKeys development team creates prompts at different levels of complexity by increasing the length (number of words) and number of pieces of information included at each level. Scoring rubrics are focused on the competency of the examinee's response: how much of the information was captured accurately for *Listening* and the adequacy of the prose (e.g., grammar, syntax, and spelling) for *Writing*. For the *Business Writing* assessment, the WorkKeys test development staff works together with professionals from a wide variety of job backgrounds to identify and refine prompt ideas that require a written response and have meaning to a broad audience. Next, they develop and revise prompts that are realistic, do not require prior knowledge, are specific and substantive enough to hold the examinee's interest, and are representative of situations that could arise in a wide variety of jobs. Prompts that meet all of these criteria are edited into a form that is clear, direct, and concise.

New prompts for all WorkKeys tests are reviewed for realism, accuracy, and fairness by a number of people including other members of WorkKeys development staff, staff members from other ACT departments, and business and academic experts outside of ACT from diverse cultural and ethnic backgrounds.

Phase 3: Prototyping. In Phase 3, the ACT WorkKeys development team recruits content experts to write items for prototyping. These experts draft items designed to meet the test specifications and correspond to the respective skill levels. ACT staff then edits the items, producing a number sufficient to create one full-length test form for the skill area.

The prototype test form is administered to convenience samples, which typically are at least two groups of high school students and two groups of employees. Usually, one group of students and one group of employees will be from the same city. The second groups of

students and employees will be found in another state with different demographic characteristics. For example, if the first groups are from a suburban setting, the second may be from an urban area. The number of examinees varies according to the test format, with more being used for multiple-choice tests than for constructed-response tests. Typically, at least 200 students and 60 employees are divided across the two administration sites for each multiple-choice prototype test form. About 135 examinees participated in the prototype testing of the *Writing* and *Listening* constructed-response assessments. In 2001, ACT conducted a prototype administration of the first forms of the *Business Writing* assessment to approximately 2,640 Midwestern high school and community college students.

During the prototype process, interviews or surveys of the examinees are used to gather their reactions to the test instrument. Educators and employers are also invited to review and comment on the test. This information helps ACT evaluate the functioning of the test specifications. Questions such as whether the prototype items were too hard, too easy, or tested skills outside the realm of the specifications must be answered before development can move to the pretesting stage. Based on all the information from the prototype testing, the test specifications are adjusted if necessary, and additional prototype studies may be conducted. When the prototype process is completed satisfactorily, a written guide for item writers is prepared.

Phase 4: Pretesting. For the pretesting phase of item development, ACT contracts with numerous freelance content experts who write a large number of items. WorkKeys item writers must be familiar with various work situations and have insight into the use of a particular skill in different employment settings to ensure content and contextual accuracy. ACT staff edits the submitted items to meet content, cognitive, and format standards. A test item containing inaccurate content may be distracting even if the specific content does not affect the examinee's ability to respond correctly to the skill portion of the item. For this reason, inaccurate facts, improbable circumstances, or unlikely consequences of a series of procedures or actions are excluded from the content of the items. An examinee who knows about a particular workplace should not recognize any of the assessment content, circumstances, procedures, or keyed (correct) responses as unlikely, inappropriate, or otherwise inaccurate.

Given the wide range of employability skills assessed, verifying content accuracy for WorkKeys is challenging. For tests such as the *Teamwork* assessment, extraordinary efforts must be made to verify the appropriateness of the keyed responses because different workplaces may endorse different responses to the same situation. To help WorkKeys staff detect any possible problems, the item writers write a justification for the keyed response and for each incorrect response for each test item. ACT editors check both the items and the justifications, and make modifications, if needed.

After the items have been edited, they are submitted to external consultants for content and fairness reviews. Qualified experts in the specific skill area being assessed, usually persons utilizing the skills regularly on the job, check for content and contextual accuracy. Members of minority groups review the items to make sure they will not be unfair or offensive to any

racial, ethnic, and gender groups. ACT provides the reviewers with written guidelines (ACT, 1995) and receives written evaluations from them. ACT staff responds to every concern the reviewers raise, and make needed adjustments to the test items before pretesting. The items are then administered in pretest forms constructed to be as similar as possible to the final test. Examinees for the pretest are drawn from schools and businesses in sufficient numbers to provide stable data on which to base final decisions.

Statistical studies of the pretest data help ACT staff identify problem items. These items are then reevaluated by staff and, if necessary, by outside experts. The tests are subjected to both classical and item response theory-based (IRT-based) statistical analyses to evaluate the psychometric properties of each item and the test forms. In addition, when sample sizes permit, statistical differential item functioning (DIF) analyses of the multiple-choice assessment items are carried out to determine whether items function differently for various groups of individuals matched on ability. Items that show DIF are eliminated from the item pool. Based on data collected during pretesting and periodically after operational administration, no items in the multiple-choice WorkKeys tests show DIF. As statistical procedures for detecting DIF in constructed-response items are not yet in common use, analytical reading of the prompts by expert reviewers serves as the basis for detecting possible bias.

Phase 5: Construction of Operational Forms. Pretest item statistics are considered carefully when the forms for operational testing are constructed. Test forms for each assessment are developed from the pool of items that meet all the content, statistical, and fairness criteria for items and for test forms. The items are presented in approximate order of their complexity. That is, the least complex items are at the beginning of the test and the most complex items are at the end. ACT staff construct at least one base form and one alternate test form for each assessment, making sure that the two forms are similar in terms of their psychometric characteristics, the test characteristics as a whole, and the within-level characteristics with respect to content and complexity.

Integral to the test development procedures described above is an effort to minimize the likelihood of adverse impact resulting from use of the WorkKeys tests. The assessments are designed to be job-related and fair through careful screening prior to their being made available to employers. Specifically, the tests and test development must meet these criteria:

- The assessments are criterion-referenced, which means that scores are interpreted in relation to job requirements rather than population norms.
- The test specifications are well defined.
- Items tap a domain of workplace skill because people who have experience in the workplace write them.
- Items measure a particular workplace skill.
- Content and fairness experts review the items to determine possible differences in responses among racial and ethnic groups and genders.

- Statistical analyses at the item and test level are conducted to monitor the performance of various subgroups.

The WorkKeys system as a whole provides a well-designed procedure that businesses, schools, and job seekers can use to facilitate and improve career transitions—from applicant to employee, from school to work, and from job to job.

Job profiling

Collecting evidence to demonstrate content validity is also important in the business setting. According to the *Uniform Guidelines on Employee Selection Procedures* (1978), validation should demonstrate that the content of the selection instrument "is representative of important aspects of performance on the job for which the candidates are to be evaluated" (section 16D). Establishing a well-defined content domain for each test is part of the process of establishing the content validity of WorkKeys tests for selection purposes. In addition, the use of a given test for selection purposes should be validated for the applicable job. The WorkKeys job profiling component addresses this aspect of the process.

It is common to conduct a job analysis to see what tasks are required for a particular job and to then use the results to build a content valid test for that job (Cascio, 1982; Dunnette & Hough, 1990). This approach works best where a test will be built specifically for each job. This is not the case with the WorkKeys system, where the same test is designed to assess generalizable skills and skill levels associated with many different jobs. Thus, the primary uses of job analysis by WorkKeys are to (a) establish the content-relatedness between a specific job and the existing WorkKeys skill area and, if the job and skill are found to be content related, to (b) establish the WorkKeys skill level required by the job. This latter task in effect establishes a skill standard for that job.

As with other judgment-based standard-setting methods, job profiling (job analysis relative to WorkKeys skill scales) must address the key issues of who should make the judgments, on what basis, and by what method. Because those setting the standards must be familiar with the job, the decision was made that the subject matter experts (SMEs) would, wherever possible, be job incumbents. Although some companies choose to include supervisors and trainers as SMEs, ACT recommends that, when feasible, the standard-setting group be comprised predominately of individuals who are doing or have recently done the job that is being profiled (ACT, 1995b; Anastasi, 1982).

The SMEs make their judgments based on their knowledge of the job under consideration and on knowledge of the WorkKeys skills and skill levels. The latter information is provided by WorkKeys job profilers during job analysis. Because of the depth of understanding that must be gained by the SMEs before they can accurately align the skills they perform in their jobs with the WorkKeys skill scales, the job profiling process is carried out in small group settings, much like focus groups. Each group of SMEs is guided by an authorized WorkKeys job profiler. The profiler is selected based on relevant previous training and experience and is authorized by ACT after completing training in the job profiling process and in the WorkKeys skills and skill levels.

Job profiling is conducted in two phases: task analysis and skill analysis. In task analysis, the SMEs identify the tasks they complete on the job and then rate them for Importance. The scale used for these ratings is provided in Section 3. The average Importance rating for each task is used to sort the task statements and list them in order, with the most important tasks placed at the beginning of the list.

In skill analysis, the SMEs first link the WorkKeys skills (such as Teamwork) to the important tasks on the list (i.e., those with ratings of 3/important and higher), identifying each task that requires the particular skill and discuss why the task requires the skill. For the task to be considered in the next step to set the skill level (i.e., cut or passing score), the majority of the SMEs had to agree that the task requires the skill. Once the set of important tasks requiring that skill has been identified, the SMEs, using successive approximation, determine which level of the skills is required for that set of tasks. The SMEs begin with a description of a skill level that the job profiler believes is just below the level needed on the job. They determine whether their job requires skills that are above, below, or about the same as the level described. If they determine that the skills they must have are higher, they are shown the next higher level; if they determine the skills they must have are lower, they are shown the next lower level. If they determine that the skills they must have are about the same, they are shown both the next higher and the next lower levels. No decision is reached until the SMEs have considered a range of skill levels: the one they have identified as the required level and at least one level above it and one level below it (unless they have chosen the highest or lowest level available). SMEs sometimes find that the level required is below or above the levels measured by WorkKeys.

Establishing the link between assessments and the job

Careful attention has been given to developing both WorkKeys assessments and the job profiling procedure in a manner consistent with the standards for content validity established in the *Uniform Guidelines* (1978), *Standards* (1999), and *Principles* (2003). The essential element of content validation is a rational demonstration of linkage between test content and important job performance requirements. In WorkKeys, this linkage is normally accomplished in two steps: (1) test items are linked to skill and skill level definitions by the assessment development process, and (2) skill level definitions are linked to job requirements by the judgment of SMEs, who are generally job incumbents (and may sometimes be supervisors or others familiar with the job).

Items written and selected for WorkKeys assessments go through a series of screens in an attempt to ensure job-relatedness and fairness. For example, both minority review (a judgmental process) and DIF analysis (a statistical procedure) are used to determine possible differences in responses among racial groups and between men and women prior to construction of the released assessments. All aspects of the test development process are conducted to ensure that items pertain to the workplace and that they tap a domain of workplace skill.

In the case of the WorkKeys job profiling process, the validation procedure involves several steps to ensure that a link is established between the skill level definitions and the requirements of a particular job. Ideally, a representative pool of SMEs should be identified. It would include the variety of races, genders, regions, locations, and so on that is represented by employees in the job to be profiled. The pool of qualified SMEs then develops a list of tasks critical/important to the job. A thorough review of each skill level definition is made and then the SMEs are asked to come to a consensus on the levels of WorkKeys skills that are required for performing the job as a whole. This comprehensive and systematic analysis of jobs helps employers identify the important tasks as well as the skills and skill levels needed to perform those tasks.

During the job profiling procedure, incumbent workers who are knowledgeable about the job set the skill level requirement for entry into the job and for effective performance (the level that is expected to be acquired through training). At the end of the skill analysis, the SMEs complete the following statements, which appear at the bottom of the skill rating form:

Skill Level _____ is necessary for effective performance of this job.
Skill Level _____ is required for entry into this job. Employees should be expected to come into the job with this skill level; they are not expected to learn this skill level on the job.

The job profile established by employees who are knowledgeable about the job is based on entry level job requirements, not on personal capabilities or "wish list" expectations. The participation of supervisors in determining the skill requirements is recommended only when the supervisors have had experience in the job.

It is possible that SMEs may identify a higher skill level as the requirement to perform the job effectively (after initial entry). However, selection decisions should be based on the entry level requirements.

Section 5

Relationship between the Selection Procedure and the Job

A. Evidence Demonstrating that the Selection Procedure is a Representative Sample of a Skill Used as Part of a Work Behavior and Necessary for that Behavior

Selection of skills

In developing the WorkKeys system, ACT consulted with employers, educators, and labor organizations to develop a list of foundational workplace skills that are used in a wide range of jobs, are teachable in a reasonable period of time, and facilitate job analysis (ACT, 1992). In 1992, initial WorkKeys foundational skills were selected on the basis of a review of the literature relating to employer-identified skill needs (Agency, 1989; ACT, 1987; Bailey, 1990; Carnavale, Gainer, & Meltzer, 1990; Center, 1990; Conover, 1991; Educational, 1975; Electronic, 1992; Greenan, 1983; Secretary's, 1990) and a survey of employers and educators who participated in the design of the WorkKeys system. The latter were from seven states (Illinois, Iowa, Michigan, Ohio, Oregon, Tennessee and Wisconsin) and a network of community colleges in California, all of which served as charter members of the WorkKeys development effort. These charter members assisted in the design and review of plans and materials and also provided examinees for the prototype and field-test phases of assessment. Twelve skills were selected for initial development based on those identified by educators and employers (McLarty, 1992). It was anticipated that this list would be modified over time in response to changing employer needs.

Skill scale development

In assessment development, it is common for the assessment to be developed first and development of score scales to follow (Crocker & Algina, 1986; Nunally & Bernstein, 1994). This is necessary for any score scale that depends on examinee data for its construction (e.g., norm-referenced score scales) because in that case the skill scale and score scale are necessarily identical. Each WorkKeys skill scale can be conceptualized as an independent definition of the construct to be measured, a definition that is not based on the psychometric characteristics or the assessment. The score scale reflects the characteristics of the assessment and can be evaluated with respect to how well the assessment scores represent the designated skills and skill levels. More than one assessment approach can conceivably use the same skill scale. In the development of the WorkKeys system, the need to link job analysis with the assessment of individuals argued for separation of the skill scale from the score scale so that both the assessment of jobs (job profiling) and the assessment of individuals could be described by the same skill scale. This circumstance required the development of skill scales before the development of the tests and their score scales.

Several skill scale criteria were identified by WorkKeys staff as critical for the operational system (McLarty, 1992). WorkKeys skill levels would have to (a) be readily interpretable as a description of what the examinee can do and the skills required by the

job; (b) be appropriate for large-scale use and for validation as part of a system for selecting qualified job applicants; and (c) provide information useful for an examinee wishing to improve skills in order to meet job requirements, an educator or trainer wishing to assist examinees in improving their job-related skills, and an employer wishing to select well-qualified employees. A primary goal was that the skill scale metric should communicate the level of a generalizable skill that the job requires, and that a person possesses, to the test taker, the teacher, the trainer, the employer, the labor union leader, and other audiences. Based on their content, the WorkKeys skill scales would have to communicate clearly and concisely to people making decisions using the assessment results.

The WorkKeys skill scales are, therefore, intentional scales, created to ensure that the resulting score scale will be both meaningful and hierarchical. Cognitive and content-related aspects of a skill are analyzed to identify and combine their component strands in order to generate hierarchical scales that will be meaningful to individuals, educators, and employers. Aspects of content knowledge and cognitive skills that do not contribute to the hierarchical scale are excluded from it. The quality of the resulting skill scales is then judged by the degree to which they serve as a common metric to link the job analysis to the assessments and by their usefulness in identifying the skill levels required by jobs and possessed by individuals. Clustering approaches (identifying skills perceived as different but equally valuable) are intentionally excluded from the scale-building process, although such clusters could become the basis of separate skill scales.

Thus, the WorkKeys skill levels are designed to be arbitrary but standardized, and particular to each skill. To explain, while a hat size of six is arbitrary but standardized, it is not expected to be comparable to a shoe size of six. A woman who wants to purchase a hat and shoes will need to measure both her head and her feet using scales that are appropriate for those parts, and no one would suggest that her feet are better than her head if she needs size six shoes and a size six hat. Similarly, just as a person who needs size six shoes does not automatically need a size six hat, a Level 6 in *Reading for Information* is not the same as Level 6 in *Locating Information*. However, Level 6 in *Reading for Information* does mean the same skill level whether it is used to describe a job or a person, and Level 6 in *Locating Information* means the same thing when it is an individual's assessment score that it means when it is part of a job profile. The common metric, then, forges a link between assessment results and job analysis, but does not indicate a relationship between skills.

Currently, ten WorkKeys assessments are available for operational use: *Applied Mathematics, Applied Technology, Business Writing, Listening, Locating Information, Observation, Reading for Information, Teamwork, Workplace Observation,* and *Writing*. In the process of developing the skill scales, the WorkKeys development team has refined the following procedure for establishing hierarchical skill scales. Each WorkKeys skill scale is developed initially by a panel of employers and educators. The panel first develops a broad definition (such as "workplace observation") of the skill area for which a scale is to be developed, identifies examples of tasks within this broadly defined skill domain, and narrows that domain to those examples which are important

for job performance across a wide range of jobs (by excluding things like "the observation of microscopic samples"). Next, they organize the remaining tasks into strands (such as "observation for the purpose of maintaining quality control"). Within each strand, they order the tasks into a series of difficulty levels, with the lowest being the simplest and the highest being the most complex.

The number of skill levels is determined iteratively on the basis of the number of separate levels that appear to best fit the task groupings. The panel then abstracts the variables it believes cause a task to be more or less difficult. For example, less difficult observation for quality control involves (a) directed attention to one or a very small number of features which are (b) easy to differentiate from the standard and for which (c) unlimited time is allowed to make the determination. More difficult observation has (a) no specific direction as to what to attend to, (b) a large variety of features to be inspected simultaneously, (c) distractions, (d) a short time in which the determination must be made, and (e) very fine distinctions between the item inspected and the standard. This conceptual analysis process is repeated for each strand identified.

Finally, to facilitate combining the strands into a single test, the panel suggests which levels of each strand are at approximately the same levels of difficulty as given levels of other strands (the strands do not necessarily have the same number of levels). The exemplar tasks, the identification of elements of difficulty, and the suggested common levels across strands form the basis for creating a description of the skill area and its levels. This description is then reviewed by panel members and others and refined until it is as conceptually clear as possible. It should be noted here that strand refers to tasks and content that pertain to a singular concept to be measured.

Once each skill scale is defined, it is necessary to construct a test to measure individuals' skills relative to it. The WorkKeys system tests were designed to meet the following criteria:

- The way in which the skill is assessed is generally congruent with the way the skill is used in the workplace.
- The lowest level assessed is at approximately the level for which an employer would be interested in setting a standard.
- The highest level assessed is at approximately the level beyond which specialized training would be required.
- The steps between the lowest and highest levels are large enough to be distinguished and small enough to have practical value in documenting workplace skills.
- The assessments are sufficiently reliable for high-stakes decision making.
- The assessments can be validated against empirical criteria.

- The assessments are feasible with respect to administration time and complexity, as well as cost.

Skill definitions and skill levels

The Final Task Lists for the RN job are shown at the end of this report. The aggregate importance ratings and skill requirements are also shown. A checkmark in a skill column means that, according to the SMEs, the task on that row requires that skill. The skill and skill level definitions are shown in Appendix B and the skill levels required for performing the tasks are given below. Tasks shown in gray italics are of low importance (i.e., they received average importance ratings below 3) and they did not influence the skill levels set for the profile.

B. Identification of the Work Behavior That Each Part of the Selection Procedure Is Intended to Measure

The WorkKeys job profiling procedure is designed to systematically develop accurate profiles through a task analysis that is used to select the tasks most important to a job and a skill analysis that is used to identify the skills and skill levels required at entry into the job and for effective performance on that job. A description of the procedure used is given below.

Conducting the task list review

Ms. Woodham toured selected work areas of JHMH facilities on June 16, 2011 with Anna Caldwell, Surgical RN, Freida xxx, Post Op RN, Chris xxx and Pat xxx, ICU RNs, and Carol Ann xxx, ER RN. The job profiler met with the first group (Group A) of four subject matter experts (SMEs) on August 16, and met with the second group (Group B) of four different SMEs on SMEs on August 17. Each group developed task lists and identified the WorkKeys skills and skill levels needed for selection into the RN job. In the sessions, the job profiler met with each SME group to tailor the Initial Task List to make sure each Final Task List accurately and completely described the job. The SMEs added to, deleted, consolidated, and changed the descriptions of tasks, as needed, to make sure they accurately depict the RN job at JHMH.

Collecting the Importance ratings

After carefully examining this list of tasks, the SMEs rated each task according to its Importance. Importance refers to the significance of the task to overall job performance. The average Importance rating for each task was used to sort the task statements and list them in order, with the most important tasks placed at the beginning of the list. Tasks that received an average rating of 2 or lower were grayed out, italicized, and moved to the bottom of the list.

Identifying on-the-job behaviors associated with each skill as it is used on the job

Once the SMEs understood the definition of a WorkKeys skill and had determined its relevance to the job, they independently identified the important tasks on the Final Task

List that required the skill and they identified how the tasks specifically use that skill. For example, the Reading for Information skill may be identified by SMEs as necessary for reading such documents as Standard Operating Procedures or company policies. After discussing the relationship between the skill and the tasks, only those tasks which the majority of SMEs agreed require the skill were included in the subsequent discussion, and only those tasks were used to determine the level of skill required for the job.

Determining the WorkKeys skill levels of the job

The job profiler presented detailed descriptions of the WorkKeys skill levels to the SMEs and showed them examples of problems or situations employees deal with at each level. For each WorkKeys skill, the SMEs decided which skill level is necessary at job entry and for effective performance of the job.

Prioritizing the WorkKeys skills

The WorkKeys skills are prioritized in terms of their importance to the RN job. This is based on a systematic examination of the number of important (or critical) tasks identified by the SMEs as requiring each skill and the Importance rating of those tasks. The result is an ordering of the WorkKeys skills that are most important to the performance of the job. The skills, in priority order, are presented below.

C. Comparison of the Manner, Setting, and Level of Complexity of the Selection Procedure with Those of the Work Situation

Section 3 of this report documents the need for specified WorkKeys skills by identifying the important tasks that require those skills. This section (Section 5) summarizes the SMEs' discussions of the skill levels and documents their reasons for finding that the specified levels are required for both job entry and effective performance of the job. The skill levels required for job entry and for effective performance are presented in Tables 1 and 2 in the Executive Summary.

Workplace Observation

The WorkKeys Workplace Observation skill is an employee's skill in visually observing a workplace event, noticing details, and remembering instructions, procedures, processes, and demonstrations in order to generalize to workplace situations that may be similar or very different from what was observed. Employees must pay careful attention to steps that are followed, to safety procedures, and to quality-control standards.

In determining the level of skill necessary for the tasks of the job, the SMEs considered the following five characteristics:

- the complexity of the procedures,
- how likely there are to be extra details presented,
- how likely there are to be distractions,

- how difficult is it to detect differences, discrepancies, or changes, and
- the action the employee must take.

The SMEs were shown Workplace Observation skill Levels 2 through 5.

The SMEs were shown Workplace Observation skill Levels 3 through 5.

The SMEs stated that Level 3 Observation skills are required for job entry.

At Level 3, employees watch complex procedures that include several tasks that may occur at the same time, interact, and change from one situation to another. More than one condition (if-then or cause-effect) may be present. Several important details are presented, but a few are not clearly prompted. Some distractions may make remembering details difficult. The employee may be asked to apply information observed to other similar situations. Steps may seem similar, but differ based on varying factors. A few differences may be present that are not clear.

The SMEs explained that Level 3 Workplace Observation skills are used in the job when applying instructions for following and implementing safety practices, observing for environmental risk/exposure, and performing patient care. RNs originally learn how to observe and perform these tasks through working with a preceptor and the completion of in-service training, ongoing formal training and on-the-job training programs. When performing these tasks, RNs must watch complex procedures that occur at the same time such as when monitoring patient care by observing for levels of physical activity, medications being taken, food intake and patient responses to treatment plans. When observing patients more than one condition will often be present such as the patients cognitive skills may limit their ability to understand and follow instructions and/or their ability to articulate how they are feeling. RNs must be able to monitor important details being presented regarding the patients welfare and care needs while also considering the conditions of each patient situation. For example, when certain medications are being/have been administered, the RN may need to closely observe for reactions in the patient based on their current status and limit the level of movement/activity allowed for the patient during that time span to ensure his/her safety and wellbeing.

Assessment and Documentation of Patient Condition:

Complexity: RNs are trained in straightforward procedures they must follow for assessing and documenting patients' conditions. For example, they may be assessing an injury that could be a sprain or it could be a compound fracture. RNs must be sure to cover all steps in the assessment process to accurately uncover the degree of the injury. Each step must be followed closely to ensure they have thoroughly observed the patient for health condition/changes and then filed an admission assessment, nursing care plan, submitted flow sheets and medical administration records along with nurse notes that cover pertinent information about the patient. RNs must observe and perform complex

procedures that include several tasks that may occur at the same time, interact, and change from one situation to another. More than one condition (if-then or cause-effect) may be present. For example, when being checked a patient may verbally insist that they have a sprained ankle, but show a strong reaction to pain felt when the area around the spleen is pressed. RNs must be observing for reactions to a variety of stimuli when assesses a patient's care needs.

Details: Patient assessment and documentation consists of a lot of steps that must be completed and a lot of details that must be observed in order to accurately note a patient's condition or care needs. For example, nurses in the ER may be assessing a wound to determine the level of care needed while also making sure documentation of their findings are being clearly detailed in all forms required. They must also make sure they have followed all instructions for uncovering unique health issues about the patient such as discussing any allergies that exist or outstanding medical problems and then documenting those findings according to procedures learned and observed. In most situations when assessing patient needs and documenting findings, RNs must maintain attention to significant details with little prompting such as reactions patients may have to the level of pain felt when an area of injury is being checked.

Distractions: In many cases, there are multiple distractions such as questions from healthcare professionals, reactions by patients and sounds/alarms going off in the medical care facility or room and RNs may find remembering some details difficult due to these distractions. Also, there may be 2-3 different forms which are color-coded in different ways that can present problems in following the correct steps in a learned procedure for how and what to document. RNs are not always directed on which forms to use in many cases so they must identify differences and/or details that are not clear and then select, interpret, and integrate the steps, in the correct order, within a complex process such as in assessment and documentation of patient conditions.

Differences: In assessment and documentation situations, Level 3 skills are required because RNs must distinguish steps that seem similar but are different based on varying factors among different patients that may not be clear. In other words, if allergies exist RNs must know what questions to ask and know to take different steps toward fully assessing the condition of the patient because the allergy may dictate the need for special medications that might not otherwise be required. This may also involve documenting patient conditions using a variety of different types of documentation that may require a series of additional steps in documenting their findings or require them to combine steps to achieve desired results.

Action: Actions taken will vary from patient to patient based on findings. RNs must know when the steps to take may seem similar but must vary based on the diversity of patient factors.

Environmental/Safety

RNs must use Level 3 Workplace Observation skills when following safety procedures for wearing proper PPE, reporting/documenting accidental exposure/contamination to appropriate medical personnel and conducting follow up according to protocol. They must also use Level 3 skills to maintain safe environments for patients and workers by retrieving information regarding infection control issues such as referring to labs and patient history and then communicating among units regarding infection control procedures. And, RNs use Level 3 Workplace Observation skills when handling environmentally hazardous waste following procedures learned for the disposal of soiled items in utility rooms.

Complexity: When addressing environmental and safety issues, RNs must be able take their observation of complex procedures on how to handle hazardous situations and know how to apply these steps among a variety of situations whether it is a spill involving body fluid which could spread disease or an accidental exposure/contamination of a healthcare professional, patient, visitor or family member to a deadly virus. And, they must follow observed protocol for documenting and reporting such incidents.

Details: RNs are responsible for maintaining a safe environment for patients and workers by retrieving information regarding infection control issues such as referring to labs and patient history and then communicating among units regarding infection control procedures. These procedures will involve many details and steps that must be followed such as identifying a course of action to be taken given more than one condition.

Distractions: Some distractions during these procedures may make remembering details to be covered difficult such as fire alarms may go off in facility and they can be hard to disregard, spills in room could be a safety concern that creates distraction or an IV pump is beeping constantly creating difficulty in communicating clearly.

Differences: Some differences must be taken into consideration but are not always clear to the RN such as a regular spill of water vs. something more serious like body fluids that have spilled which can spread an infectious disease.

Action: Based on the type and level of exposure, RNs must assess each situation individually and consider the conditions of the event then adjust their actions to ensure all infection control measures are exercised to ensure the safety of patient, healthcare providers and others who may have been exposed to the hazard. They must also follow instructions for reporting and documenting the event.

The SMEs stated that Level 4 Workplace Observation skills are required for effective performance. Level 4 skills are mostly used when providing a range of patient care to address different medical issues among patients.

At Level 4, employees must analyze and determine the basic principles before a process can be generalized to a new situation. Several conditions are present that may influence the course of action. Strong distractions compete for attention. Some steps may not be

demonstrated (i.e., inferred). Some of the differences are difficult to notice. When employees use Level 4 skills on the job, they can make inferences from situational cues in a demonstrated process or procedure, derive steps that are missing from a partial or non-explicit pattern, process or procedure, apply complicated instructions to new situations, decide which conditions apply to a new situation, determine the general principle underlying the condition, process, or procedure, determine what comes next, break down a given process and apply results to unfamiliar processes to complete a task or diagnose a problem, and use situational cues to determine steps to be taken.

RNs must use Level 4 Workplace Observation skills when observing such things as crisis situations because they must recognize the level of emergency and apply complicated instructions to new situations and decide which conditions apply to the new situation. They must follow learned procedures for intervening quickly, follow protocol for contacting healthcare professionals needed and readying medical equipment as necessary. Level 4 Workplace Observation skills may also be used when observing for patient level of need for anesthetics and application of bandages, splints, and other healing devices. This includes assessing the degree and size of the injury, patient age and other factors that will influence the level of care needed because they must determine the general principles underlying the condition, determine what should come next, and break down the situation to diagnose a problem. When applying leadership skills, RNs must observe the level of care and techniques being used by other healthcare professionals and provide directives on how to make inferences from situational cues in a process or procedure being conducted. They must also observe for steps that are missing from a procedure or process and ensure all steps are completed.

Patient Care

Complexity: RNs must analyze and determine the basic principles before a process can be generalized to a new situation. Several conditions are present that may influence the course of action. For example, when being checked, a patient may verbally insist that they have a sprained neck, but show a strong reaction to pain felt when the area around their spline is pressed. RNs must make inferences from situational cues in a demonstrated process or procedure in order to draw conclusions about what a patient's care should be.

Details: RNs must often rely on medical reports and lab results to determine what comes next in a process or procedure but many times lab work received is not explained making working with the details of the patient's condition even more complex to analyze. RNs must often break down a given process and apply results to unfamiliar processes to complete a task or diagnose a problem.

Distractions: When addressing patient care especially in crisis situations, many strong distractions may be present. For example, numerous complaints may be occurring from patients, family members and even healthcare providers who need information. Family members may be interfering with the RNs ability to provide care effectively and

sometimes even how a patient looks or what they are wearing such as being really dirty or unusual looking will serve as a strong distraction to the job at hand. And, in routine cases, having the O2 monitor off a patient's finger can be a major distraction for attention that is not really relevant.

Differences: Some differences may be difficult to notice such as some patients may have a higher tolerance to pain than others which can be misleading in determining the extent of an injury or health crisis. And, some patients may have reactions to medications that are delayed or very subtle in nature and can be hard to notice. Other differences exist but are more obvious such as variances in age like working with babies versus young people or the elderly.

Action: RNs must be thorough and complete in following all learned and observed procedures for assessing levels of patient care needed. In some cases, their actions may need to include such things as reversing medications or retrieving additional equipment such as telemetry pacs to aid in monitoring a patient's condition.

RNs can enter into the job using Level 3 Workplace Observation skills because upon entering into the job their exposure to a variety of RN work situations in this particular work environment will have been limited. Also, over a period of one year RNs will be exposed to various units of care such as ICU, ER, and Pre-op which will increase their opportunity to apply instructions learned on handling various patient situations to actual workplace events which will help to increase their Workplace Observation skills to a Level 4. In addition, they will receive in-service training and preceptor assistance to train them up to a Level 4.

Locating Information

The WorkKeys Locating Information skill is the skill people use when they work with workplace graphics such as charts, graphs, tables, forms, flowcharts, diagrams, floor plans, maps, and instrumental gauges. Employees use this skill when they find information in a graphic or insert information into a graphic. They also use it when they compare, summarize, and analyze information found in related graphics.

To determine the level of Locating Information skill needed for the tasks employees complete in their job, the SMEs considered the difficulty of the graphics and how hard it is for employees to find the information they need and make use of it. The SMEs compared the tasks of the job to WorkKeys Locating Information skill levels 3 through 6.

Entry Level

Level 4 Locating Information skills are required for entry into the job of RN. At level 4, employees use workplace graphics that are straightforward. They may be basic order forms, diagrams, line graphs, tables, flowcharts, instrument gauges, or maps. At Level 4, employees may work with one or two graphics at a time to find several pieces of

information, understand how graphics are related to each other, to summarize information, identify trends or compare information and trends among graphics.

According to the SMES, Level 4 Locating Information skills are used when they must maintain a safe environment for patients and workers with regard to infection control issues and procedures. The lab work, equipment and computer programs used for these types of tasks include graphics, charts and instrument gauges that are straightforward. These tasks would require working with one or two graphics at a time finding several pieces of information, understanding how the graphics and information relate to each other and then summarize the information found in order to complete the task. For example, when dealing with an infection control issue, RNs may need to look up the physician's dictations in the patient records to find out what the health issue, disease or infection is while also referring to lab reports and CTs to locate outcomes of patient testing and then summarize information on environmental hazards pertinent to the patient.

When planning patient care, RNs must develop a care plan using specific forms such as patient assessments, treatment plans and discharge planning forms. Forms and charts used in these tasks, once again, require the use of one or more graphics at a time since creating the care plan requires charting a wide-range of information such as pain control, tissue profusion and patient mobility. These forms and charts are straightforward but must be used collectively by the RN to summarize the patient's condition and health status and then determine treatment plans. Because many forms and charts may be referenced, the RN may need to compare information and results found in different assessments or tests in order to create a plan of care that is suitable for the patient.

When documenting changes in patient conditions, RNs use Level 4 Locating Information Skills to file admission assessments and populate 24-hour flow sheets, file medical administration records, identify allergies, and even clarify home meds. These forms and charts are straightforward. RNs will need to find or fill in several pieces of information regarding medicines, doses, interactions and allergies. While these forms and charts are straightforward, the RN will need to compare information across charts to look for trends and to summarize the information toward properly assessing patient needs and best approaches to healthcare.

Effective Performance Level

Level 5 Locating Information skills are required for effective performance in the RN job.

At Level 5 employees work with workplace graphics that are complicated. The graphics are sometimes in a less common format (such as a three-dimensional bar graph). They may be detailed forms, tables, graphs, diagrams, maps, or instrument gauges. At Level 5, employees may work with one or more graphics at a time. They may need to sort through distracting information, summarize information, identify trends and compare information.

The SMEs agreed that any forms, graphs or instrument gauges involving anesthetics would require Level 5 Locating Information skills. This level of skill is critical when dealing with anesthetics because a patient could die if anesthetics are not administered and monitored properly. Forms such as Heparin Protocol Form, Propfol Form and Patient Control Anesthesia Forms all fall under less common formats and are complicated due to having high levels of information and detail in them. These forms also contain a lot of information that is not always useful toward the completion of the task at hand so RNs must sort through distracting information that is not needed and draw from the charts/forms only what is needed.

Completing an Occurrence Report would also require Level 5 Locating Information skills because all information required must be populated following OSHA guidelines as applicable. This includes a lot of detailed information which may be inserted into a form that is in a complicated format with multiple columns and rows along with small print and a lot of distracting information.

RNs can enter into the job using Level 4 skills because their responsibilities for completing forms and charts will increase over time. Also, over a period of one year RNs will be exposed to various units of care such as ICU, ER, and Pre-op which will increase their level of locating information skills to a Level 5 for effective performance. In addition, once on the job they will receive on-the-job training, more extensive in-service training and preceptor assistance.

Reading for Information

The WorkKeys Reading for Information skill is the skill people use when they read and use written text in order to do a job. The written texts include memos, letters, directions, notices, bulletins, policies, and regulations. It is often the case that these workplace communications are not necessarily well written or targeted to the appropriate audience. Reading for Information materials do not include information that is presented graphically, such as in charts, forms, or blueprints.

To determine the level of Reading for Information skill needed for the tasks employees complete on the job, the SMEs considered the difficulty of the reading materials and how hard it is for employees to find the information they need and make use of it. The SMEs evaluated their work situation as it compares to WorkKeys Reading for Information skill levels 3 through 7.

Entry Level

The SMEs agreed that Level 5 Reading for Information skills are required for entry into the RN job. At Level 5, policies, procedures, and announcements have many details. The information that employees need to finish a task is stated directly, but it is hard to understand because of the way it is worded. The materials include jargon, technical terms, and acronyms or words that have several meanings. The employee must consider several factors in order to identify a course of action that will accomplish their goals. Employees need to figure out the correct meaning of a word based on how the word is

used, identify the correct meaning of an acronym that is defined in the document, identify the meaning of a technical term or of jargon that is defined in the document, apply technical terms and jargon and relate them to stated situations, apply straightforward instructions to a new situation that is similar to the one described in the material and apply complex instructions that include conditionals to situations described in the materials.

RNs use Level 5 Reading for Information skills when they maintain safe environments for patients and workers. This requires interpreting information regarding such tasks as handling infection control by referring to infection control procedures when dealing with exposure or contamination. These situations may also require them to refer to patient medical records and labs to gather information on the impact this exposure may have on a patient's condition. When reading these types of documents, they include procedures that can be hard to understand because they contain jargon and technical terms that are specific to the medical field. Therefore, RNs may need to figure out the meaning of words based on its use and even define acronyms. They also need to consider several factors in order to identify a course of action that will accomplish their goals. RNs need to interpret what they read at a level that will allow them to relate what they read to similar situations and then apply complex instructions to those situations that include conditionals. For instance, if blood is spilled in a patient's room, they may read, interpret and apply complex instructions on how to handle that spill to prevent further contamination but they must also consider varying factors around that specific situation such as the patient's disease type, level of severity of exposure, length of time for exposure and level of threat exposure may create to patient and others.

Level 5 Reading for Information skills are also required when reading MSDS (Material Safety Data Sheets) in order to follow standards for handling environmentally hazardous waste. RNs must dispose of waste in utility rooms following strict procedures. These directives often contain technical terms that may need to be related to a given situation. And, conditionals may need to be taken into consideration. For example, when disposing of some soiled items, the item(s) must be placed in a plastic bag prior to disposal so that no leakage occurs and then placed in the container specifically designated for those types of soiled items.

RNs used Level 5 Reading for Information skills when completing research on patient care. These documents are educational in nature and are written specifically for the healthcare field so they contain an extensive amount of jargon and technical terms. RNs read and interpret this information in order to seek out nursing updates and applications specific to certain medical conditions. Technical terms must be able to relate technical terms and jargon to stated and/or new situations as needed.

Level 5 Reading for Information skills are also used when managing individual performance evaluations by keeping competency assessment data up to date. This requires RNs to read documents such as medical textbooks and journals for education which are written using jargon and technical terms that may be hard to understand because of the way it is worded. They must study and interpret from these journals

information specific healthcare that would require them to apply complex instructions to new and varied situations in their field of work.

Effective Performance Level

Level 6 Reading for Information skills are required for effective performance in the job of RN.

Level 6 materials include elaborate procedures, complicated information, and legal regulations found in all kinds of workplace documents. They use complicated sentences with difficult words, jargon, and technical terms. Most of the information is not clearly stated. When employees use Level 6 Reading for Information skills on the job, they must be able to identify implied details, use technical terms and jargon in new situations, figure out the less common meaning of a word based on the context, apply complicated instructions to new situations, figure out the principles behind policies, rules, and procedures, apply general principles from the materials to similar and new situations, and explain the rationale behind a procedure, policy, or communication.

Level 6 Reading for Information skills are required by RNs when ordering, interpreting and evaluating medical (diagnostic) tests to identify and assess a patient's condition such as when reading CT scans. These tests include elaborate procedures and complicated medical information. The level of language is difficult because it is written in medical ease and most of the information is not clearly stated so RNs must identify implied details and also use these terms in new situations. For example, no patient diagnosis is ever the exact same due to varying health status, age, gender, allergies, or drug interactions that must be factored in. So, RNs must refer to a number of documents simultaneously to correctly assess a patient's condition while also taking into consideration that a lot of information is implied and must be clarified before a final assessment can be made.

Level 6 skills are required when making decisions around solving problems in routine/crisis situations in order to apply leadership skills with peers and other healthcare professionals. The RNs job is to make decisions in many cases based on distinguishing activities to be taken and results needed for a particular situation. RNs rely on a variety of written information to help them with these decisions. For example, they may need to read and interpret a radiology report on a patient to determine what the ultimate outcome needs to be for a certain patient. They must then be able to explain the rationale behind a procedure, policy or communication to their peers and other healthcare providers.

RNs also use Level 6 Reading for Information skills when reading guidelines for operating medical machines and equipment. For example, in order to carry out a patient's regime, RNs must read guidelines for operating and performing basic troubleshooting on the medical equipment required to treat that patient. This may pertain to such things as tourniquets, cauteries, drills, telemetry and the like. The language used in these equipment guidelines include elaborate procedures, complicated information and use complicated sentences with difficult words, jargon, and technical

terms specific to that piece of equipment. In these cases, RNs may need to figure out the less common meaning of a word based on the context, apply complicated instructions to new situations where the equipment is needed and sometimes even explain the rationale behind a procedure for operating or troubleshooting medical equipment and devices.

The entry level varies from the effective performance level because the responsibility levels increase for RNs over time spent performing specific tasks. For example, RNs work in a variety of areas such as surgery, intensive care, pre-op, and the emergency room. Entering into the RN job at a Level 5 allows them time to increase their reading ability to a Level 6 after their level of exposure to various situations has increased. They move from a Level 5 to 6 through the completion of in-service training, ongoing formal training and on-the-job training programs including working with a preceptor. The SMEs agreed that their level of exposure to more complex documents ultimately requiring a Level 6 reading for information skill should occur within a period of one year on the job.

Applied Mathematics

WorkKeys Applied Mathematics is the skill people use when they use mathematical reasoning and problem-solving techniques to solve work-related problems. Employees may use calculators and conversion tables to help with the problems, but they still need to use math skills to think them through.

In evaluating the level of Applied Mathematics skill necessary for the tasks of the job, the SMEs considered the types of mathematical operations (including single-step or multiple-step mathematical operations and conversions either within or between systems of measurement); how the information in the problem is presented (i.e., the information is presented in the order in which it is needed or it must be reordered); and whether all the information employees need for solving problems is provided or if they must derive some necessary information. The SMEs evaluated their work situation in comparison to WorkKeys Applied Mathematics skill levels 4 Shown through 7.

Entry and Effective Performance Level

The SMEs agreed that Level 5 Applied Math skills are required for both entry into the job of RN and for effective performance.

Level 5 tasks require several steps of logic and calculation. When employees use Level 5 Applied Mathematics skills on the job they can decide what information, calculations, or unit conversions to use to find the answer to a problem. Look up a formula and change from one unit to another in a single step within a system of measurement (for example, converting from ounces to pounds). Look up a formula and change from one unit to another in a single step between systems of measurement (for example, converting from centimeters to inches). Calculate using mixed units, such as adding 3.50 hours and 4 hour 30 minutes. Divide negative numbers (such as -10). Identify the best deal by doing one- and two-step calculations and then comparing the results to determine

the solution that meets the stated conditions. Calculate perimeters and areas of basic shapes like rectangles and circles. Calculate percent discounts or markups.

RNs must complete a variety of math calculations daily in order to address patient needs when it comes to adjusting medicine dosages, dosage intervals, calculating how much medicine has been given versus what remains, calculating fluid intakes, completing bed boards and determining MAP. Each of these tasks requires Level 5 Applied Math skills because RNs must perform several steps of logic and calculation while also deciding what information, calculations, or unit conversions to use to find the answer to a problem. They may need to identify the ideal dosage amount over a span of time by doing one- and two-step calculations and then comparing the results to determine the solution that best meets the patient conditions. RNs are required to perform the following types of calculations:

- Registered Nurses use Applied Math skills when administering medicines to adjust dosages based on patient weight/size and timeframe required for infusion. For example, they may perform the following types of conversions: Given a Dosage of (500mg), Weight of (200lb), and Time of 1 hour, first convert pounds to kilograms by dividing the body weight by 2.2: 200/2.2=90.90 kilograms. This gives the amount of medicine to be given to the patient with a body weight of 200 pounds. The RN must then calculate how much can be infused using IV Piggy Backs per minute by calculating the following: Convert 1 hour to 60minutes/90.90kg = .66kg can be infused per minute.

- RNs also used Applied Math skills when estimating how much medicine to infuse in a set period of time. For example, given 100ccs of medicine that must be given in a one half hour timeframe, the following conversion would be required: 30minutes/100ccs = .3ccs per minute can be administered.

- RNs use Applied Math skills when calculating how much medicine has been given and how much remains to be given in order to document medications administered in flowsheets. For example, if a patient has been given 500ccs of a medicine and orders state he/she is to be given 1000ccs total, RNs must make the following calculation: 1000ccs – 500ccs = 500ccs of medicine remains to be administered to patient.

- When addressing patient health issues, RNs must use Applied Math skills to calculate how much water a patient is drinking versus fluid retention and loss. For example, they may convert 32oz water to milligrams by completing the following math operation by knowing that 30 milliliters equals 1 ounce: 32oz x 30ml = 960ml. They must also use basic math when calculating how much water has been drank by patient such as 32oz of water is required and 28oz has been consumed: 32oz – 28oz = 4oz.

- When maintaining updates on bed boards, census and assignment RNs must check the Operating Room schedule against existing patient census which means they must calculating the number of beds available vs. number of beds needed

and this requires basic math as follows: 26 beds are needed and 22 are available (26-22 = 4 beds needed).

- RNs must also maintain the number of nurses for each given area of the hospital such as monitoring number of surgical nurses, discharge nurses, ICU nurses. For this they would perform Applied Math to calculate as follows: 3 ICU nurse required on floor, 2 available (3-2 = 1 nurse needed in ICU).

- RNs must calculate the MAP (Mean Arterial Pressure) by taking the systolic of 180 x 2 = 360 plus the diastolic of 100 / 3 = 33.3 to get the MAP: 360 + 33.3 = 393.3

- RNs must also calculate dosages to be given over different intervals of time. For example, when putting 900mg of medicine into a 500cc piggy back, they must figure out the rate of infusion for the first 6 hours as follows: 6 hours x 60mins = 360, then 360/900 = .4ml/minute over 6 hour period. Then they must figure out how to deliver the rest in 18 x 60 = 1080, then calculate 1080/900 = 1.2ml/minute over 18 hour period.

NOTE: When the Applied Math skill was reconciled, ICU RNs stated that Level 6 Applied Math skills would be needed for effective performance. RNs representing the ICU stated that ICU RNs will at times need to use a Level 6 in Applied Math skills to perform such duties as calculating how to administer medications based on the type of medication being given and they would also use Level 6 skills when dealing with QT intervals. The QT would need to be divided by the square root of the R-R which pushes Applied Math to a Level 6.

Prioritizing the WorkKeys skills

The skills were prioritized according to their importance to the job based on the number of important tasks identified by the SMEs as requiring the skills. Skills with the largest percentage of important tasks requiring the skill and with the highest importance ratings for these tasks are given the top ranking. JHMH should consider using the *Workplace Observation, Locating Information, Reading for Information and Applied Math* assessments.

Section 6

Alternative Procedures Investigated

A. Testing and Performance

It is widely accepted among professionals in the area of personnel selection that cognitive ability can be used to predict performance. This conclusion is born out in the cumulative results of an extensive body of research on the validity of performance predictors (Gottfredson, 1986; Hogan and Hogan, 1990; Hunter and Hunter, 1984). This body of research reveals that paper-and-pencil tests constitute the most effective method of measuring cognitive abilities or knowledge for personnel selection. Although other selection procedures (such as interviews, reference checks, and experience ratings) can assess cognitive ability and knowledge, cognitive ability tests have more validity than these and other alternative methods of predicting applicant job performance. In their large scale meta-analysis of validity research results, Hunter and Hunter (1984) revealed that commonly used alternatives to ability tests, such as interviews, college GPA, and biodata had validities that ranged from .10 to .37. Today, most researchers and practitioners continue to agree with the Hunters' central contention:

> Meta-analysis of the cumulative research on various predictors of job performance shows that for entry level jobs [those for which current job performance is not available] there is no predictor with validity equal to that of ability, which has a mean validity of .53. For selection on the basis of current job performance the work sample test, with mean validity of .54 is slightly better. (Hunter and Hunter, 1984, p. 72)

The cumulative research suggests that for most jobs, there are currently no selection procedures for hiring new employees that approach the validity of ability tests.

B. WorkKeys Tests

The assessments in the WorkKeys system which map to profiled skills are cognitive ability tests. They each quantify individual knowledge or ability in specifically defined content areas. As with many other cognitive ability tests, the developers of the WorkKeys assessments addressed the potential for adverse impact by having the items that make up the tests reviewed by minorities and other experts for bias and offensiveness. The tests were also investigated using Differential Item Function Analysis for ethnic and gender differences in item responses, and revised accordingly.

Unlike other cognitive ability tests, the WorkKeys assessments further reduce the potential for adverse impact through the nature of their construction and use. The tests are criterion referenced. That is, they are constructed to yield specific information about a person's performance relative to an established criterion standard without reference to other test-takers or norms (Buck, 1975). WorkKeys job profiling establishes the passing score, and then the assessments are used to identify a pool of applicants who have reached the established criterion level. The tests are not used to rank applicants from

highest to lowest, so there is none of the adverse impact that typically results from such ranking procedures (Nathan, 1995).

C. Scope of Investigation

ACT's investigation of alternatives to the WorkKeys assessments comprised a search for testing or screening instruments of similar skills and an evaluation of their validity, adverse impact, and relationship to work. The skills of interest are *Applied Mathematics, Applied Technology, Listening, Locating Information, Observation, Reading for Information, Teamwork, Workplace Observation, Writing*, and *Business Writing*. The search for other assessments of these skills began with a broad search for other procedures that have been validated for use in personnel selection. Three comprehensive references for assessments, *Tests in Print* (Murphy, Spies, & Plake, 2006), *Mental Measurements Yearbook* (Conoley & Impara , 1995), and *Tests* (Maddox, 1997), proved to be valuable sources of information and were used to identify alternative measures of the knowledge and abilities of interest. The descriptions and reviews published in these references indicate whether a given assessment was developed for use in personnel selection, and they provide some information on each instrument's construction, content, and validity. In some cases, additional information was obtained from technical reports provided by a test's publisher and from published research articles. Finally, the search for alternatives was rounded out with a review of the catalogs and Internet Web pages of test publishers known to provide assessments for personnel selection, and by searching the assessment research literature.

D. Method of Investigation

The EEOC (1985), in its interpretation and clarification supplement to the *Uniform Guidelines on Employee Selection* (1978), identified two criteria for evaluating alternative selection procedures: validity and adverse impact. In evaluating the alternatives identified in the search described above, validity, adverse impact, and relationship to work were used as evaluative criteria. Relationship to work is the extent to which an assessment's stimulus materials reflect materials or situations found on jobs, or the intended behavioral overlap between the assessment and jobs. This criterion was included to supplement explicit validity information. When considering the assessments included in this study, "adverse impact" refers to the extent to which attempts were made to enhance test fairness and eliminate discriminatory language and racial, cultural, or gender bias from the assessments. As such, it is an indicator of an assessment publisher's dedication to eliminating adverse impact and it is not always an actual measure of the existence of adverse impact.

E. Investigation Findings

In general, there were several alternatives to the WorkKeys *Applied Mathematics* and *Reading for Information* to consider. There were only two alternatives to WorkKeys for assessing applicants on their *Locating Information, Teamwork* and *Writing* skills. The search revealed four alternatives to the *Listening* skills assessment and six alternatives for the *Applied Technology* assessment. There was only one assessment similar to the

WorkKeys *Observation* and *Workplace Observation* assessments and three alternatives for the *Business Writing* assessment. The search revealed no other civilian alternatives designed for these purposes, although there are several observation tests specific to police work available to law enforcement agencies. Despite the variety of sources used to compile this section of the report, information needed for the evaluation of the various alternatives was at times incomplete.

F. Investigation Conclusions

No evidence was found to suggest that any of the alternatives investigated exceed the WorkKeys assessments in validity or attention to reducing adverse impact. While a number of the alternatives appear work related in content, only the WorkKeys assessments have an explicit link or reference back to the requirements of a specific job. Like WorkKeys, a number of the alternative assessments attempt to address fairness and adverse impact through a careful consideration of test content, but only the WorkKeys assessments combine careful attention to content with a criterion-based method of test construction that in itself reduces the potential for adverse impact (Nathan, 1995). Based upon the results of this investigation, the combination of job specific content validity evidence and safeguards against adverse impact make the specific WorkKeys assessments recommended in the Executive Summary a viable selection alternative in this situation. The WorkKeys assessments recommended in the Executive Summary should be used in conjunction with their respective entry-level cut scores listed in both Table 1 of the Executive Summary and in the write-up of Section 5 of this report. Final decisions about the use of these assessments are entirely within the purview of the company including whether or not to obtain additional evidence about alternative procedures prior to making those decisions.

Section 7

Uses and Applications

A. Methods Considered For Use as Part of the Selection Procedure

The WorkKeys assessments will be used as a part of the JHMH selection procedure for hiring employees into the RN job at the facility in Phenix City, Alabama. Applicants will be required to meet the entry-level profile, as set by the subject matter experts (SMEs), for the skills being assessed. They will either meet or not meet (pass or fail) the requirements. They will not be ranked by their performance levels as established by the assessments.

Based on the relevance of the skills to the critical tasks of the job, JHMH should consider building a WorkKeys assessment battery for applicants for the RN job using the Workplace Observation, Locating Information, Reading for Information, and Applied Math skills.

B. Rationale for Choosing the WorkKeys System

The WorkKeys system provides job-related, content-valid cutoff scores by determining the level of cognitive skills necessary for specific jobs. The job profiling component of the system requires a trained job profiler to work with one or more groups of SMEs to develop a thorough list of tasks performed on the job and to provide information about the level of skill necessary for performing the tasks or job upon job entry and/or for effective performance. During a job profile session, SMEs are able to make direct comparisons between the content of their job and the content of WorkKeys skill levels. The SMEs evaluate and discuss whether job incumbents need a certain skill level (as defined and described through the use of examples in the profiling session) to enter the job. The SMEs are asked to decide how a skill description and the accompanying examples compare to the skill needed on the job: is the skill needed higher, lower, or about the same as the description and examples? (These are paired comparison judgments.) The examples used for these judgments are consistent with the ordinal scaling of the empirically tested skill levels of the tests.

An important issue in selection testing is that of adverse impact. The EEOC considers adverse impact to be evidence of discrimination. However, showing that the selection device is job-related despite its adverse impact is the employer's response to a claim of adverse impact. Demonstration of a test's validity for use in selecting qualified employees is the typical measure of a test's job-relatedness. A common misconception is that tests are valid or invalid and that valid tests do not have adverse impact. However, as Nathan (1995) explains, the reality is that all competently developed cognitive ability tests are valid (see, for example, validity generalization results) and also have adverse impact. The use of information obtained from valid tests must still be supported by evidence that the tests and the cutoff scores are appropriate to the situation.

WorkKeys addresses the issue of adverse impact in several ways. ACT has developed the WorkKeys assessments to be job-related and fair by putting the items through a series of screens prior to their being included in tests that are used for selection decisions. These are:

- the assessments are criterion-referenced (they use job requirements as the reference);
- the test specifications are well defined;
- items are written by people who have job experience in the workplace, so the items tap a domain of workplace skill;
- items measure a particular workplace skill;
- content and fairness experts review the items to identify possible differences in responses by people in different racial groups and between men and women prior to construction of the released assessment; and
- statistical analyses at the item and test level are conducted to monitor the performance of various subgroups and of the items and tests, themselves. For example, differential item functioning (DIF) analysis, a statistical procedure for identifying bias for or against such things as race and gender is run for each item.

The job profiling process provides validation evidence by establishing a link between tasks performed on the job, the skills needed to perform the tasks, and the skills and skill levels measured with the WorkKeys assessments. The job profiling procedure requires the participation of SMEs who are knowledgeable about the job and who, together, constitute a representative sample of the incumbent employees. This group of SMEs must convene to describe, generally with consensus, the skill requirements for their job. Another group of SMEs also constituting a representative sample will confirm the task analysis results and the skill requirements in a replication session, as needed.

C. Purpose of Assessments

The WorkKeys assessments will be used as part of the selection procedure for the RN job at JHMH in the Phenix City, Alabama facility and for training purposes.

D. Determination of the Normal Expectations of the Workforce for the Cutoff Scores

See Section 3A for a complete description of the SMEs.

The SMEs determined that four are required: Workplace Observation, Locating Information, Reading for Information and Applied Math. The entry skill levels may be used as hiring cutoff scores on the relevant WorkKeys assessments.

Section 8

Contact Person

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Section 9

Accuracy and Completeness

In order to ensure completeness and accuracy of the collection and analysis of data and the reporting of the results, the following procedures were followed:

Debbie Woodham, who conducted the profiling for the RN job and prepared this report, is an ACT– authorized Job Profiler for Debbie Woodham, who conducted the profiling for the Registered Nurse job and prepared this report, is an ACT– authorized Job Profiler for The Woodham Group, Inc. Ms. Woodham has conducted WorkKeys profiling since 2000. Her background includes serving as a training facilitator for major corporations as well as serving as an instructional designer of training programs for privately and publicly-owned businesses.

In developing the WorkKeys system, including the WorkKeys assessments and the job profiling system, ACT has been, and will continue to be, guided by the *Uniform Guidelines on Employee Selection Procedures* (1978), which have been adopted by the Equal Employment Opportunity Commission (EEOC) and various other federal agencies (Ref: 29 C.F.R. Part 1607), as well as the *Standards for Educational and Psychological Testing* (AERA, et al. 1999), and the *Principles for the Validation and use of Personnel Selection Procedures* (SIOP, 2003). The profile for the RN job at JHMH adheres to the requirements of the WorkKeys system.

Appendix A

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Applied Mathematics Skill

WorkKeys Applied Mathematics is the skill people use when they use mathematical reasoning and problem-solving techniques to solve work-related problems. Employees may use calculators and conversion tables to help with the problems, but they still need to use math skills to think them through.

There are five levels of difficulty. Level 3 is the least complex and Level 7 is the most complex. The levels build on each other, each incorporating the skills assessed at the previous levels. For example, at Level 5 employees need the skills from Levels 3, 4, and 5. Examples are included with each level description.

When deciding what level of the Applied Mathematics skill employees need for the tasks they do at work, consider the following questions:

How is the information presented? That is:

- Is it presented in the same order that it is needed?
- Is it necessary to change the order that the information is in before the math can be performed?

Is all the information needed for solving the problems provided? That is:

- Is all the information presented in the right form?
- Is it necessary to do some calculations to get some of the important information?
- Does the problem require a formula?
- Does the information need to be taken from a graphic?

What kind of mathematical operations do employees perform? That is:

- Can the math problem be completed in one step?
- Does the problem need to be done in several steps?
- Is it necessary to convert measurements from one form to another, either within or between systems of measurement?

Applied Mathematics Level 3

Level 3 problems can easily be translated from a word problem to a math equation. All the needed information is presented in a logical order and there is no extra information given.

When employees use Level 3 Applied Mathematics skills on the job, they can:

- Solve problems that require a single type of mathematical operation. They add or subtract either positive or negative numbers (such as 10 or -2). They multiply or divide using only positive numbers (such as 10).
- Change numbers from one form to another. For this they use whole numbers (such as 10), fractions (such as ½), decimals (such as 0.75), or percentages (such as 12%). For example, they can convert $\frac{4}{5}$ to 80%.
- Convert simple money and time units (for example, hours to minutes and vice versa).

For example, at this level employees can add the prices of several products to reach a total, and they can make the correct change for a customer.

Applied Mathematics Level 4

At Level 4, tasks may present information out of order and may include extra, unnecessary information. A simple chart, diagram, or graph may be included.

When employees use Level 4 Applied Mathematics skills on the job, they can use the skills described at Level 3, and they can:

- Solve problems that require one or two operations. They may add, subtract, or multiply using several positive or negative numbers (such as 10, -2), and they may divide positive numbers (such as 10).
- Figure out averages (such as $\frac{(10+11+12)}{3}$), simple ratios (such as $\frac{3}{4}$), simple proportions (such as $\frac{10}{100}$ cases), or rates (such as 10 mph). For this they use whole numbers and decimals.
- Add commonly known fractions, decimals, or percentages (such as ½, .75, or 25%).
- Add three fractions that share a common denominator (such as $\frac{1}{8} + \frac{3}{8} + \frac{7}{8}$).
- Multiply a mixed number (such as $12\frac{1}{8}$) by a whole number or decimal.
- Put the information in the right order before they perform calculations.

For example, at this level, employees can figure out sales tax or a sales commission on a previously calculated total, and they can find out rates of use or business flow.

Applied Mathematics Level 5

Level 5 tasks require several steps of logic and calculation. For example, at this level employees may complete an order form by totaling an order and then computing tax.

When employees use Level 5 Applied Mathematics skills on the job, they can use the skills described at Levels 3 and 4, and they can:

- Decide what information, calculations, or unit conversions to use to find the answer to a problem.
- Look up a formula and change from one unit to another in a single step within a system of measurement (for example, converting from ounces to pounds).
- Look up a formula and change from one unit to another in a single step between systems of measurement (for example, converting from centimeters to inches).
- Calculate using mixed units, such as adding 3.50 hours and 4 hour 30 minutes.
- Divide negative numbers (such as -10).
- Identify the best deal by doing one- and two-step calculations and then comparing the results to determine the solution that meets the stated conditions.
- Calculate perimeters and areas of basic shapes like rectangles and circles.
- Calculate percent discounts or markups.

Applied Mathematics Level 6

Level 6 tasks may require considerable translation from verbal form to mathematical expression. They generally require considerable setup and involve multiple-step calculations.

When employees use Level 6 Applied Mathematics skills on the job, they can use the skills described at Levels 3, 4, and 5, and they can:

- Use fractions with unlike denominators, reverse percentages, or multiply two mixed numbers.
- Rearrange a formula before solving a problem (for example, $8X = 20 \Rightarrow X = \frac{20}{8}$).
- Look up and use two formulas to change from one unit to another unit within the same system of measurement (for example, 1 cup = 8 fluid ounces; 1 quart = 4 cups).
- Look up and use two formulas to change from one unit in a system of measurement to a unit in another system of measurement (for example, 1 mile = 1.61 kilometers; 1 liter = 0.264 gallons).
- Find mistakes in problems that belong at Levels 3, 4, and 5.
- Find the best deal and use the result for another calculation.
- Find the area of basic shapes (rectangles and circles) when it may be necessary to rearrange the formula, convert units of measurement in the calculations, or use the result in further calculations.
- Find the volume of rectangular solids.
- Calculate multiple rates (such as by comparing production rates or pricing plans).

Applied Mathematics Level 7

At Level 7, the task may be presented in an unusual format and the information presented may be incomplete or implicit. Tasks often involve multiple steps of logic and calculation.

When employees use Level 7 Applied Mathematics skills on the job, they can use the skills described at Levels 3, 4, 5, and 6, and they can:

- Solve problems that include nonlinear functions (such as rate of change) and/or that involve more than one unknown.
- Find mistakes in Level 6 problems.
- Convert between systems of measurement that involve fractions, mixed numbers, decimals, or percentages.
- Calculate multiple areas.
- Calculate volumes of spheres, cylinders, or cones.
- Set up and manipulate complex ratios or proportions.
- Determine the better economic value of several alternatives by using graphics or by finding a percentage difference or a unit cost.
- Apply basic statistical concepts such as measures of central tendency (e.g., mode, median, and weighted mean).

LOCATING INFORMATION SKILL

The WorkKeys Locating Information skill is the skill people use when they work with workplace graphics such as charts, graphs, tables, forms, flowcharts, diagrams, floor plans, maps, and instrument gauges. Employees use this skill when they find information in a graphic or insert information into a graphic. They also use it when they compare, summarize, and analyze information found in related graphics.

There are four levels. Level 3 is the least complex and Level 6 is the most complex. At each new level, employees need more demanding skills in addition to the skills used at the previous levels. For example, Level 5 includes the skills used at Levels 3, 4, and 5. At Level 3, employees look for information in simple graphics and fill in information that is missing from simple graphics. At Level 6, employees may use the information in one or more complex graphics to draw conclusions and make decisions. The complexity can also increase as the quantity and/or density of the information increases.

When considering the level of Locating Information skill needed for the tasks employees complete on the job, you should think about the difficulty of both the graphics and the task.

You might consider the following questions:

How difficult are the graphics? That is:

- How many graphics are used?
- Are the graphics simple or complicated?

Do the graphics use elementary, common language or do they include unfamiliar, technical terms or symbols?

- How many extra details are included?
- How complicated is the employee's task when using the graphics? That is:
- Is it only necessary to use information that is stated clearly?
- Does the information in the graphics need to be summarized or compared?
- Is the information in the graphics used to draw conclusions or make decisions?

Locating Information Level 3

Level 3 workplace graphics are elementary. They may be simple order forms, bar graphs, tables, flowcharts, maps, instrument gauges, or floor plans. At Level 3, employees use one graphic at a time.

When employees use Level 3 Locating Information skills on the job, they can:

- Find one or two pieces of information in a graphic.
- Fill in one or two pieces of information that are missing from a graphic (for example, they might fill in a bill number on a form).

Locating Information Level 4

Level 4 workplace graphics are straightforward. They may be basic order forms, diagrams, line graphs, tables, flowcharts, instrument gauges, or maps. At Level 4, employees may work with one or two graphics at a time.

When employees use Level 4 Locating Information skills on the job, they can use the skills described at Level 3, and they can:

- Find several pieces of information in one or more graphics.
- Understand how graphics are related to each other (for example, they might use a parts table and shipping ticket together).
- Summarize information from one or more straightforward graphics (for example, they might find how many oak trees in an inventory table are taller than four feet).
- Identify trends shown in one or more straightforward graphics (for example, they might use a line graph to find how sales of a product change from one month to another).
- Compare information and trends shown in one or more straightforward graphics.

Locating Information Level 5

Level 5 workplace graphics are complicated. The graphics are sometimes in a less common format (such as a three-dimensional bar graph). They may be detailed forms, tables, graphs, diagrams, maps, or instrument gauges. At Level 5, employees may work with one or more graphics at a time.

When employees use Level 5 Locating Information skills on the job, they can use the skills described at Levels 3 and 4, and they can:

- Sort through distracting information (that is, information in a graphic that may not be useful for the current task).
- Summarize information from one or more detailed graphics (for example, they might find the maple trees in an inventory table that are taller than four feet, are less than $50, and are in the sales region).
- Identify trends shown in one or more detailed or complicated graphics (for example, they might use a detailed line graph to find how sales of five separate products changed from March to July).
- Compare information and trends from one or more complicated graphics.

Locating Information Level 6

Level 6 workplace graphics are very complicated. They contain large amounts of information and may have challenging formats (such as a wiring diagram, airplane control chart, or contour map). They may be very detailed graphs, charts, tables, forms, maps, and diagrams. At Level 6, employees may work with one or more graphics at a time, and connections between the graphics may be subtle.

When employees use Level 6 Locating Information skills on the job, they can use the skills described at Levels 3, 4, and 5, and they can:

- Draw conclusions based on one complicated graphic or several related graphics.
- Apply information from one or more complicated graphics to specific situations (for example, using multiple schedule forms and clinic maps, they might find times for several people to visit doctors, clinicians, and labs in various parts of a large hospital).
- Use the information to make decisions (for example, they might use handling forms, facility maps, and storage guidelines to figure out where to put a product that is highly flammable and/or corrosive).

Reading for Information Skill

WorkKeys Reading for Information is the skill people use when they read and use written text in order to do a job. The written texts include memos, letters, directions, notices, bulletins, policies, and regulations. It is often the case that these workplace communications are not necessarily well written or targeted to the appropriate audience. Reading for Information materials do not include information that is presented graphically, such as in charts, forms, or blueprints.

There are five levels of difficulty. Level 3 is the least complex and Level 7 is the most complex. The levels build on each other, each incorporating the skills assessed at the preceding levels. For example, at Level 5, employees need the skills from Levels 3, 4, and 5. The reading materials at Level 3 are short and direct. The material becomes longer, denser, and more difficult to use as readers move toward Level 7. The tasks also become more complex as readers move from Level 3 to Level 7. At Level 3, readers begin by finding very obvious details and following short instructions. At the more complex levels, tasks can also involve more application and interpretation.

When you consider what level of Reading for Information skill is needed for the tasks employees complete on the job, you might consider the following questions:

How difficult are the materials? For example:

- Are the sentences short, simple, and clear, or are they complex and possibly even confusing?
- Do the materials use only common words, or do they include difficult words, jargon, and words used in unfamiliar ways?
- How much extra information is included?

How complicated is the task? For example:

- Is it only necessary to use information that is stated clearly?
- Is it necessary to draw conclusions based on the reading materials before using the information?
- Do the employees need to apply the information to a situation exactly like the one described in the materials or to one that is quite different?

Reading for Information Level 3

Level 3 reading materials include basic company policies, procedures, and announcements. They are short and simple, with no extra information. Employees read the materials to find out what they should do. All the information they need is stated clearly and directly, using easy words and straightforward sentences.

When employees use Level 3 Reading for Information skills on the job, they can:

- Pick out the main ideas and clearly stated details.
- Choose the correct meaning of a word when the word is clearly defined in the reading.
- Choose the correct meaning of common everyday and workplace words (such as employee, timecard, office).
- Choose when to perform each step in a short series of steps.
- Apply instructions to a situation that is the same as the one they are reading about (such as knowing what button to push first after reading instructions on how to run a copy machine).

Reading for Information Level 4

Level 4 reading materials include company policies, procedures, and notices. They are straightforward, but have longer sentences and contain a number of details. These materials use common words, but do have some harder words, too. They describe procedures that include several steps. When following the procedures, employees must think about changing conditions that affect what they should do.

When employees use Level 4 Reading for Information skills on the job, in addition to using Level 3 skills, they can:

- Identify important details that may not be clearly stated.
- Use the reading material to figure out the meaning of words that are not defined for them.
- Apply instructions with several steps to a situation that is the same as the situation in the reading materials.
- Choose what to do when changing conditions call for a different action. For example, they can follow directions that include "if-then" statements.

Reading for Information Level 5

At Level 5, policies, procedures, and announcements have many details. The information that employees need to finish a task is stated directly, but it is hard to understand because of the way it is worded. The materials include jargon, technical terms, and acronyms or words that have several meanings. Employees must consider several factors in order to identify a course of action that will accomplish their goals.

When employees use Level 5 Reading for Information skills on the job, in addition to using the skills described at Levels 3 and 4, they can:

- Figure out the correct meaning of a word based on how the word is used.
- Identify the correct meaning of an acronym that is defined in the document.
- Identify the meaning of a technical term or of jargon that is defined in the document.
- Apply technical terms and jargon and relate them to stated situations.
- Apply straightforward instructions to a new situation that is similar to the one described in the material.
- Apply complex instructions that include conditionals to situations described in the materials.

Reading for Information Level 6

Level 6 materials include elaborate procedures, complicated information, and legal regulations found in all kinds of workplace documents. They use complicated sentences with difficult words, jargon, and technical terms. Most of the information is not clearly stated.

When employees use Level 6 Reading for Information skills on the job, in addition to using the skills described at Levels 3, 4, and 5, they can:

- Identify implied details.
- Use technical terms and jargon in new situations.
- Figure out the less common meaning of a word based on the context.
- Apply complicated instructions to new situations.
- Figure out the principles behind policies, rules, and procedures.
- Apply general principles from the materials to similar and new situations.
- Explain the rationale behind a procedure, policy, or communication.

Reading for Information Level 7

At Level 7, the reading materials are very complex. The information includes a lot of details, and the concepts are complicated. The vocabulary is difficult. Unusual jargon and technical terms are used, but they are not defined. The writing often lacks clarity and direction. Readers must draw conclusions from some parts of the reading and apply them to other parts.

When employees use Level 7 Reading for Information skills on the job, in addition to using the skills at Levels 3, 4, 5, and 6, they can:

- Figure out definitions of difficult, uncommon words based on how they are used.
- Figure out the meaning of jargon or technical terms based on how they are used.
- Figure out the general principles behind the policies and apply them to situations that are quite different from any described in the materials.

Workplace Observation Skill

WorkKeys® Workplace Observation is the skill that employees use to visually observe a workplace event, notice details, and remember instructions, procedures, processes, and demonstrations in order to generalize to workplace situations that may be similar or very different from what was observed. Employees must pay careful attention to steps that are followed, to safety procedures, and to quality-control standards.

There are five levels. Level 1 is the least complex and Level 5 is the most complex. The levels build on each other, each incorporating the skills assessed at the previous levels. For example, Level 5 includes the skills used at Levels 1, 2, 3, 4, and 5. The skill level is determined by the complexity of the situation being observed and the task(s) that employees are asked to do based on their observations. At Level 1, employees must be able to recall information from a short, straightforward sequence with few details, no distractions, and obvious differences from the standard. For example, they may need to identify the next step in a series of steps. At Level 5, employees must be able to generalize information from a complex situation to new situations in order to make accurate predictions or anticipate changing variables. Distractions and differences are difficult to recognize.

A DVD shows examples of situations that belong at each skill level. When you consider what skill level is needed for the tasks that employees complete on the job, think about the following things:

How complex is the procedure being observed and remembered?

- Is it logical or illogical, familiar or new, commonplace or unique, straightforward or complicated?
- How much information is involved, and are the procedure's parts independent or interactive?
- How much distracting information is there?
- Are extra details likely?
- How difficult is it to detect differences, discrepancies, or changes?

How difficult is the task that employees are asked to do?

- How much generalizing is the employee required to do? Are they identifying the next step in a straightforward process or are they determining how a change will affect an outcome?
- How subtle are the details or differences in the procedure to be noticed by employees? Are these differences significant?
- Are employees required to apply instructions, demonstrations, procedures, or processes to other situations?
- Do employees need to take changing conditions into account to choose the best course of action?

Workplace Observation Level 1

At Level 1, employees follow a short, straightforward, and simple procedure with each step clearly shown. The task is performed in a routine and predictable manner. There are no distractions and differences are obvious. There are a few details, but no unnecessary details.

When employees use Level 1 Workplace Observation skills on the job, they can:

- Repeat a short, straightforward demonstration, process, pattern, or procedure
- Recognize an incorrect step (wrong order or not in process)
- Identify the next step in a series of steps
- Put steps in correct order
- Identify a missed or incorrect step
- Match placement or identify misplacement of components (e.g., follow instructions for putting phone cord in proper location when packing a box)

Workplace Observation Level 2

At Level 2, employees interpret a straightforward procedure, but there is a condition (if – then or cause-effect). Several possible things may happen and a specific response is provided for each one. There are obvious and easily disregarded distractions. There are a few extra details and differences.

When employees use Level 2 Workplace Observation skills on the job, they can:

- Recognize cause and effect in a straightforward demonstration, process, pattern, or procedure
- Filter out obvious distractions
- Identify the cause of a particular effect (e.g., alarm sounds when pressurized air is released)
- Recognize what to do next in a situation given a single condition
- Indicate action to be taken when there is an incorrect step identified

Workplace Observation Level 3

At Level 3, employees watch complex procedures that include several tasks that may occur at the same time, interact, and change from one situation to another. More than one condition (if-then or cause-effect) may be present. Several important details are presented, but a few are not clearly prompted. Some distractions may make remembering details difficult. The employee may be asked to apply information observed to other similar situations. Steps may seem similar, but differ based on varying factors. A few differences may be present that are not clear.

When employees use Level 3 Workplace Observation skills on the job, they can:

- Identify course of action to take given more than one condition
- Distinguish steps that seem similar but are different based on varying factors
- Maintain attention to significant details with little prompting
- Recognize when steps can be combined and when they must be kept distinct
- Combine steps to achieve desired result
- Identify differences and/or details that are not clear
- Select, interpret, and integrate the steps, in the correct order, within a complex process
- Apply information to a similar situation

Workplace Observation Level 4

At Level 4, employees must analyze and determine the basic principles before a process can be generalized to a new situation. Several conditions are present that may influence the course of action. Strong distractions compete for attention. Some steps may not be demonstrated (i.e., inferred). Some of the differences are difficult to notice.

When employees use Level 4 skills on the job, they can:

- Make inferences from situational cues in a demonstrated process or procedure
- Derive steps that are missing from a partial or non-explicit pattern, process or procedure
- Apply complicated instructions to new situations
- Decide which conditions apply to a new situation
- Determine the general principle underlying the condition, process, or procedure
- Determine what comes next (e.g., tiling a floor and figuring out the next placement in the pattern)
- Break down a given process and apply results to unfamiliar processes to complete a task or diagnose a problem
- Use situational cues to determine steps to be taken

Workplace Observation Level 5

At Level 5, employees evaluate a new situation with multiple conditions and then choose the best course of action. General principles may be difficult to determine and may need to be applied differently in order to achieve a desired outcome. The situation requires innovation and the level of abstraction may be high. Distractions are present that appear to be relevant but are not. Differences are difficult to recognize and/or evaluate.

When employees use Level 5 skills on the job, they can:

- Determine the best course of action by applying principles to a new situation and/or when the information is not complete.
- Make accurate predictions based on what has been observed (e.g., what is the likely result).
- Consider the implications of a process or procedure and how they will affect outcomes.
- Prioritize appropriately (identify aspects of process that should be given priority under certain circumstances, identify parts of the process that can be omitted in different circumstances)
- Identify ways to improve the process
- Evaluate whether something is or is not a distraction

Appendix C

WorkKeys Terminology

This information is presented in the order that it typically appears during a job profile.

WorkKeys Skills — Applied Mathematics, Applied Technology, Business Writing, Listening, Locating Information, Observation, Reading for Information, Teamwork, Workplace Observation, Writing

Job Profiling — A procedure to determine the most critical tasks for a job and to determine the WorkKeys skills and skill levels required to perform these tasks.

Job Profile — The result of conducting one or more job profiling sessions which shows the most critical/important tasks for a job and the WorkKeys skills and skill levels required to perform a job.

Profiler — An individual who has completed ACT's WorkKeys Job Profiling training program successfully. An ACT authorized profiler has been trained to facilitate the job profiling process while using the SkillPro® software and write a report of the profile results

SME — Subject matter experts are employees currently performing the job or people knowledgeable about the job being profiled (e.g., supervisors or people who have been recently promoted from the job).

Profiling Session — A focus group meeting facilitated by an ACT authorized job profiler. The job profiler meets with SMEs to perform a task analysis and skill analysis.

Initial Task List — Prior to the profiling session, the profiler develops an Initial Task List using information compiled from databases (e.g., O*NET), job-related documentation (e.g., job descriptions, resources from similar job profiles, training materials), and information gathered from the tour of the facility.

Task Analysis

A task analysis consists of three parts:

- The job profiler meets with the SME group to tailor the Initial Task List (i.e., add, edit, and delete tasks), making sure that the Final Task List accurately and completely describes the job.
- The SMEs independently rate each task for Importance.
- The profiler calculates the importance of each task using the SME Importance ratings, and sorts the task statements by placing the most important tasks at the beginning of the list. The SMEs review and confirm the order of the tasks. The product of the task analysis is the Final Task List.

Importance

The importance of the task to the job. Importance is represented by the mean Importance rating for each task.

Final Task List

A list specifying the critical/important tasks for a job in statements that have been reviewed and edited by SMEs and then placed in order using SME Importance rating averages.

Skill Analysis

A skill analysis occurs after a task analysis is completed and consists of two parts:

- The SME group identifies the critical/important on-the-job behaviors (i.e., tasks from the Final Task List) that are associated with the WorkKeys skills under consideration.
- The SME group compares detailed descriptions of the WorkKeys skill levels to the critical/important tasks that require the specified skill. The job profiler seeks to bring the group to a consensus regarding the skill levels required at job entry and for effective performance.

Entry-Level

Following the Uniform Guidelines on Employee Selection Procedures (1978), WorkKeys defines entry as an employee's first day performing the job. The entry-level skill requirements are recommended for use as cutoff scores on the related WorkKeys assessments.

Effective Level

Effective performance is the point at which an employee performs competently without continuous supervision. Effective performance Level levels are provided for use as training goals.

Replication

Replication sessions are additional profiling sessions with different groups of SMEs. Replication sessions are used to make sure that the results are consistent from one group to another, especially when there are a large number of incumbents on the job.

Reconciliation

When SME groups do not agree on skill requirements (generally for job entry) the profiler meets with representative SMEs from each group to resolve the differences in a reconciliation session.

Profile Report	A summary generated by the profiler that includes the Final Task List, detailed descriptions of the session discussions of each skill, and recommendations for using the results.
Assessment	A test used to evaluate individuals' performance in a skill area. Scores on the WorkKeys assessments can be compared to the WorkKeys skill levels identified in a profile. The difference between the profiled level and a score indicates the need for training.
Skill Gap	When the profiled skill level is higher than the assessment score, the difference is referred to as a "skill gap."

Appendix D

Group A Final Task List

The Final Task Lists for the job are shown in the tables below. The mean importance ratings and skill requirements are also shown. A checkmark in a skill column means that, according to the SMEs in the profile session, the task on that row requires that skill. The names of the WorkKeys skills have been abbreviated to save space, as follows: Applied Mathematics (AM), Applied Technology (AT), Business Writing (BW), Listening (L), Locating Information (LI), Reading for Information (RI), Teamwork (TW), Workplace Observation (WO), and Writing (W). Tasks are presented in order, from those most critical to job performance to those least critical. The tasks in gray italics received mean ratings of Importance below 2 (i.e., low importance) and were not included in the skill analysis. The Importance Sum (i.e., sum of importance ratings for the skill) and Skill Percent (i.e., percentage of important tasks requiring the skill) for each skill are shown at the end of the table. The total Importance Sum possible is 265.

Tasks	Importance	Applied Math	Locating Information	Reading for Information	Workplace Observation
Applies medication administration knowledge when working with patients by identifying/recognizing right patient, drug, route, dose, time, indications, drug interactions and side effects.	5	☑	☑	☐	☑
Follow safety procedures when completing works tasks by wearing proper PPE, reporting/document accidental exposure/contamination to appropriate medical personnel & follow up according protocol.	5	☐	☐	☑	☑
Maintain safe environment for patients and workers by retrieving information regarding infection control issues such as referring to labs & patient history and then communicating among units regarding infection control procedures.	5	☐	☑	☑	☑
Monitor all aspects of patient care by observing physical activity, medications, eating, diet and nutrition, and modifying patient treatment plans as indicated by patients' responses and conditions.	5	☐	☑	☐	☑
Organizes & implements a safe therapeutic patient care regime by recognizing dynamics of changes that may occur, recording	5	☐	☑	☐	☑

& reporting these symptoms & changes & adjusting the plan of care by prioritizing care regime to accommodate changes.					
Plans patient care by developing written plan of care that utilizes data collected in assessment, incorporates the medical plan of care, demonstrates knowledge of resources available, sets priorities & establishes realistic outcomes & discharge planning.	5	☐	☑	☐	☑
Respond to volatile/aggressive patient, family, visitor by initiating call to health team and/or security for assistance.	5	☐	☑	☐	☑
Responds quickly to patients needs by responding to pager, assessing critical care needs, conducting triage, consulting with healthcare professionals, hooking up equipment and monitors, etc.	5	☐	☑	☐	☑
Responds to crisis situations by recognizing emergency, intervening quickly, contacting healthcare personnel, and operating equipment, etc.	5	☑	☑	☐	☑
Serves patients in an ethical and confidential manner by keeping all records private and handling both patient and non-patient issues in a manner that adheres to JHMH's policies and procedures.	5	☐	☑	☑	☑
Updates patient care status by communicating changes and progress to patient, family members and healthcare team (ICU nurse, doctor, staff, etc.) regarding such things as medications and side effects, etc.	5	☐	☑	☐	☑
Adhere to JHMH policy and procedure for patient care by maintaining a ratio of 6-7 patients to one nurse.	4	☐	☐	☑	☐
Administers local, intravenous, & other anesthetics and applies healthcare devices such as bandages, splints, by assessing patient needs based on injury, size, age, etc. & following instructions for using medical equipment/supplies.	4	☑	☑	☐	☑
Applies leader skills by making decisions & solving problems in routine/crisis situations, distinguish between activities & results,	4	☐	☑	☐	☑

recognize outcomes, serving as a resource for peers & other health care professionals, support staff, patients & families.					
Applies time mangmt skills to prioritize daily functions/tasks by revising plans of care, assisting others, providing for unit equipment organization/maintenance, & other tasks that facilitate unit workflow.	4	☐	☑	☐	☑
Assess, plan, implement and evaluate patient care plans by consulting and coordinating with health care team members.	4	☐	☑	☐	☑
Assist healthcare pros in delivering patient care by operating medical equipment/tools such monitoring units/accessories, floor grade forceps/hemostats, medical oxygen masks/parts, peripheral intravenous catheters, suction kits, etc.	4	☐	☐	☐	☑
Attempts to solve problems by conferring with patients and healthcare staff and taking the initiative to investigate options/solutions.	4	☐	☑	☐	☑
Collaborates with patients, families and healthcare teams by initiating, coordinating & participating in patient care conferences when applicable.	4	☐	☐	☐	☑
Collaborates with physicians & healthcare team by discussing patient issues and concerns, recommending solutions, etc.	4	☐	☑	☐	☑
Collects, interprets and communicates all appropriate patient data by reviewing pertinent findings with anesthesia or other healthcare professionals.	4	☐	☑	☑	☑
Complete all work tasks in a timely/orderly fashion by prioritizing them according to the criticality of need by the patients and healthcare team.	4	☐	☐	☐	☑
Complete basic work forms (computerized/hard copy) by populating or locating patient information in such documents as transfusion, specimen log book, clinical institute withdrawal assessment for alcohol, non-DKA insulin protocol, etc.	4	☑	☑	☐	☑
Complete basic work forms by populating or locating info in Daily Vital Signs/Intake & Output, Critical Results Tracking,	4	☐	☑	☐	☑

ICU Charge Nurse Report Sheet, Report Off, Intensive Care Unit 24-Hour Flowsheet, etc.					
Complete discharge for patients by reviewing procedure, medication, discharge instruction form and follow up visits creating information/education packet for patient. .	4	☐	☑	☑	☑
Complete patient assessments by cndctg admit interviews, complete systmtic physical assmt & interpret available data incldg med history/current med status/vital signs/lab work/x-rays/other diagnostic tests/fncial/spiritual/ psych/physio/social & age need	4	☐	☑	☑	☑
Delegates work to other team members as needed by evaluating team, assessing patient needs, assigning the right task to right person, monitoring work completed,etc.	4	☐	☐	☐	☑
Develop and promote health improvement programs by instructing individuals, families and other group on topics such as health education, disease prevention and childbirth and help them plan & implement programs to improve overall health of communities.	4	☐	☑	☐	☑
Direct and coordinate infection control programs by advising and consulting with specified personnel about necessary precautions.	4	☐	☑	☐	☑
Directs & supervises less skilled nursing or health care personnel or supervise a particular unit by coaching/assisting & providing feedback in areas such as developing accurate/thorough doc skills & following policies/procedures for patient charting.	4	☐	☑	☑	☑
Documents changes in patient condition, care given & response to care given by filing admit assmt, nursing care plan, flowsheets, med admin record, & nurse notes cvrg pertinent info in thorough/legible manner/conforming to JHMH policy/procdre on chartg	4	☑	☑	☑	☑
Ensure problems are address/resolved according to hospital	4	☐	☐	☐	☑

policy by adhering to established procedures and regulations such as following chain-of-command in reporting, etc.					
Ensures all proper documentation and all billable charges are captured by reviewing patient charts routinely.	4	☐	☑	☐	☑
Ensures patient safety by implementing patient positioning requirements while maintaining proper body alignment for all types of surgical procedures.	4	☐	☐	☐	☑
Ensures proper nursing care by observing nurses and visiting patients routinely.	4	☐	☐	☐	☑
Evaluates patient care by reviewing effectiveness of patient plan based on patient progress versus expected outcomes and changing clinical status and revising plan or adjusting expected outcomes.	4	☐	☑	☐	☑
Handle direct admit patients from office or emergency room by filling out medical history on physical conditions, medications, allergies, etc.	4	☐	☑	☑	☑
Handle environmentally hazardous waste following procedure by disposing of items in soiled utility room, etc.	4	☐	☑	☑	☑
Handle medical products dispensing by using HMS scanning system for scanning supplies, etc. for accurate charge to patient.	4	☐	☑	☐	☑
Handle routine nursing activities by completing tasks such as set up CPM chain, vacuum wounds, redo dressings, change out blood, read information to patient to check arm band, call in prescriptions/appointments, make rounds with docs.	4	☐	☑	☐	☑
Identify and assess patient's condition by ordering, interpreting and evaluating diagnostic tests to identify and assess patient's condition.	4	☐	☑	☑	☑
Identify potential health or safety problems by assessing the needs of individuals, families or communities, including assessment of individuals' home or work environments.	4	☐	☐	☐	☑
Maintain updates on bed boards, census & assignment by checking Operating Room schedule against existing patient	4	☐	☑	☐	☑

census.					
Maintains clean/safe hospital/patient environment by assisting housekeeping with room cleaning such as removing debris, spills, unclean bed linens, etc.	4	☐	☐	☐	☑
Maintains prof. dev. by attending 50% of dept staff meetings, sign minutes of mtgs not attended, maintain up-to-date CPR, safety trng & TB tstng, cmplte annual/critical competencies identified for assigned dept, stays aware of changes/advances in field.	4	☐	☑	☐	☑
Participates in professional development programs by actively pursuing cont ed & certifications, unit/mandated in-services, patient conferences, &/or annual workshops in areas such as disease processes, medications, & treatments.	4	☐	☑	☐	☑
Plan transfusions & blood work by obtain & verify blood products including orders, consents, checking patient charts for information, & progress notes, etc.	4	☐	☑	☑	☑
Populate daily nursing record form in triage paperwork by inserting written notes regarding issues of focus/concern.	4	☐	☑	☐	☑
Promotes JHMH's role in community by greeting and interacting with all patients, families, visitors, vendors, and guests in a courteous and respectful manner.	4	☐	☐	☐	☑
Recommend drugs, medical devices or other forms of treatment, such as physical therapy, inhalation therapy, or related therapeutic procedures.	4	☑	☐	☐	☑
Reports patient cond accurately & thoroughly to ensure continuity of care by using Hand Off communication that includes patient assmt, situation & safety to peers, charge nurse, daily nursing supervisor & other health care pros involved in patient care.	4	☐	☑	☐	☑
Track new patient information and status by collecting information from family members, collaborating with physicians, and consulting with healthcare team.	4	☐	☑	☐	☑

Works as a team player by providing support or relief for other staff as needed.	4	☐	☐	☐	☑
Acts as a preceptor for new staff by providing unit orientation & continuing education for students and employees, supports activities for making new personnel feel welcomed and important.	3	☐	☐	☐	☑
Address issues and concerns relevant to the practice and profession of nursing by consulting with institutions or associations for advice and counsel.	3	☐	☑	☐	☑
Anticipates problems by monitoring changes in clinical status and adapts plan of care to meet patient needs and reviews pertinent findings with anesthesia.	3	☐	☑	☐	☑
Coordinate patient stays by discussing patient status with case manager and/or utilization coordinator.	3	☐	☐	☐	☑
Manages individual performance evaluation by maintaining all personal performance and keeping competency assessment data up to date, attending all required programs, and meeting ABN CEU requirements by obtaining 12 ABN CEU credits annually.	3	☐	☑	☐	☑
Manages medical equipment to carry out patient regime by locating, operating and caring for (including minor troubleshooting) of things such as tourniquets, cauteries, drills, telemetry, etc. as needed to meet patient needs.	3	☐	☑	☑	☑
Perform physical examinations, make tentative diagnoses, and treat patients en route to hospitals or at disaster site triage centers.	3	☐	☑	☐	☑
Prepares for annual performance evaluation conference by submitting completed skills lists, education attendance documents and self-evaluation to Clinical Manager the month prior to evaluation date.	3	☐	☑	☐	☑
Promotes resolution of concerns and conflict by routing through correct mechanism or resolving the situation.	3	☐	☐	☐	☑

Run tests on Crash carts and refrigerators by making sure temperature for meds and juices is maintained, check print outs and change O2 tanks, etc.	3	☐	☑	☐	☑
Seek out current nursing updates and applications regarding specific patient care practices by engaging in research activities related to nursing.	3	☐	☑	☑	☑
Serves as a mentor/preceptor, participating in QI (quality initiative) activities & completing monitors (such as crash cart checks), cost containment initiatives, new product/equipment evals & failed equipment reporting.	3	☐	☑	☐	☑
Serves as a professional role model by meeting basic appearance & behavioral standards, recognizing & maintaining professional boundaries, participating actively in unit activities	3	☐	☐	☐	☑
Works with overflow issues such as limited bedding by communicating with house supervisor, verifying admissions & discharges.	3	☐	☑	☐	☑
Adheres to patient safety policies by complying w/ surgical site verifctn & time-out policies, review planned procedure & verify surgical consent w/patient, surgeon privileges & surgical assistant needs, & equipment function & inspects for safety.	*2*				
Maintain and check product supplies daily by checking forms and supply area and order products based on space and storage area.	*2*				
Observe and document hospital room status by checking operating room schedule for number and rooms available, etc.	*2*				
Offer options and alternatives for medical care by referring students or patients to specialized health resources or community agencies furnishing assistance.	*2*				
Perform administrative and managerial functions, such as taking responsibility for a unit's staff, planning, and long-range goals.	*2*				
Provide medical support in locations such as schools, hospitals,	*2*				

and industry by providing health care, first aid, immunizations and assistance in convalescence and rehabilitation.					
Sets up home health care and communication processes by contacting external health care service providers & discuss patient needs & case issues.	*2*				
Sets up operating area by preparing rooms, sterile instruments, equipment and supplies, and ensuring that stock of supplies is maintained.	*2*				
Support ongoing professional development of nursing staff by providing or arranging for training or instruction of auxiliary personnel or students.	*2*				
Support surgeons during operations by handing items to surgeons, informing physician of patient's condition during anesthesia, etc.	*1*				
Complete basic work forms by populating or locating information in such documents as Tissue Exam Request, Autoclave, Implant Log Sheet, OR Nurse Report, Operative Antibiotic Administration Form, Time Out Forms.	*0*				
Implements surgical safety by cmplting all counts accurately, verify item sterility prior to intro onto sterile field, provide appropriate shielding from x-ray for patient & surgical team, monitors sterile field for break/potential breaks in sterility.	*0*				
Importance Sum		26	196	61	261
Skill Percent		9.0	73.1	22.4	98.5

Appendix E

Group B Final Task List

The Final Task Lists for the job are shown in the tables below. The mean importance ratings and skill requirements are also shown. A checkmark in a skill column means that, according to the SMEs in the profile session, the task on that row requires that skill. The names of the WorkKeys skills have been abbreviated to save space, as follows: Applied Mathematics (AM), Applied Technology (AT), Business Writing (BW), Listening (L), Locating Information (LI), Reading for Information (RI), Teamwork (TW), Workplace Observation (WO), and Writing (W). Tasks are presented in order, from those most critical to job performance to those least critical. The tasks in gray italics received mean ratings of Importance below 2 (i.e., of low importance) and were not included in the skill analysis. The Importance Sum (i.e., sum of importance ratings for the skill) and Skill Percent (i.e., percentage of important tasks requiring the skill) for each skill are shown at the end of the table. The total Importance Sum possible is 242.

Tasks	Importance	Applied Math	Locating Information	Reading for Information	Workplace Observation
Applies leader skills by making decsns & slvng problems in routine/crisis situations, distinguish between activities & results, recognize outcomes, serving as a resource for peers & other health care professionals, physicians, spprt staff, patients & fam.	5	☑	☐	☑	☑
Applies medication administration knowledge when working with patients by identifying/recognizing right patient, drug, route, dose, time, indications, drug interactions and side effects.	5	☑	☑	☑	☑
Assist healthcare pros in delivering patient care by operating medical equipment/tools such monitoring units/accessories, floor grade forceps/hemostats, medical oxygen masks/parts, peripheral intravenous catheters, suction kits, etc.	5	☑	☐	☑	☑
Documents changes in patient condition, care given & response to care given by filing admit assmt, nursing care plan, flowsheets, med admin record, & nurse notes cvrg pertinent info in thorough/legible manner/conforming to JHMH policy/procdre on chartg	5	☑	☑	☑	☑

Ensure problems are address/resolved according to hospital policy by adhering to established procedures and regulations such as following chain-of-command in reporting, etc.	5	☐	☐	☑	☑
Ensures all proper documentation and all billable charges are captured by reviewing patient charts routinely.	5	☑	☑	☐	☑
Ensures proper nursing care by observing nurses and visiting patients routinely.	5	☐	☐	☐	☑
Follow safety procedures when completing works tasks by wearing proper PPE, reporting/document accidental exposure/contamination to appropriate medical personnel & follow up according to protocol.	5	☑	☑	☑	☑
Handle environmentally hazardous waste following procedure by disposing of items in soiled utility room, etc.	5	☐	☐	☐	☑
Handle medical products dispensing by using HMS scanning system for scanning supplies, etc. for accurate charge to patient.	5	☑	☑	☐	☑
Handle routine nursing activities by completing tasks such as set up CPM chain, vacuum wounds, redo dressings, change out blood, read information to patient to check arm band, call in prescriptions/appointments, make rounds with docs.	5	☑	☑	☐	☑
Identify and assess patient's condition by ordering, interpreting and evaluating diagnostic tests to identify and assess patient's condition.	5	☑	☑	☐	☑
Identify potential health or safety problems by assessing the needs of individuals, families or communities, including assessment of individuals' home or work environments.	5	☐	☑	☑	☑
Maintain safe environment for patients and workers by retrieving information regarding infection control issues such as referring to labs & patient history and then communicating among units regarding infection control procedures.	5	☐	☑	☑	☑
Manages individual performance evaluation by maintaining all personal performance and keeping competency assessment data up to date, attending all required programs, and meeting ABN	5	☑	☐	☑	☐

CEU requirements by obtaining 12 ABN CEU credits annually.					
Monitor, organize & implement all aspects of patient care plan observing phy act, medications, eating, diet & nutrition, & mdfy plans as indicated by patients' responses & conditions, sets priorities & establishes realistic outcome & dischrg.	5	☑	☐	☐	☑
Observe and document hospital room status by checking operating room schedule for number and rooms available, etc.	5	☑	☑	☐	☑
Plan transfusions & blood work by obtain & verify blood products including orders, consents, checking patient charts for information, & progress notes, etc.	5	☑	☑	☐	☑
Promotes JHMH's role in community by greeting and interacting with all patients, families, visitors, vendors, and guests in a courteous and respectful manner.	5	☐	☐	☐	☑
Recommend drugs, medical devices or other forms of treatment, such as physical therapy, inhalation therapy, or related therapeutic procedures.	5	☑	☐	☑	☑
Reports patient cond accurately & thoroughly to ensure continuity of care by using Hand Off communication that includes patient assmt, situation & safety to peers, charge nurse, daily nursing supervisor & other health care pros involved in patient care.	5	☑	☑	☑	☑
Responds to crisis situations by recognizing emergency, conducting triage, intervening quickly, contacting healthcare personnel, and operating equipment, etc.	5	☑	☐	☐	☑
Serves as a professional role model by meeting basic appearance & behavioral standards, recognizing & maintaining professional boundaries, participating actively in unit activities.	5	☐	☐	☑	☑
Updates patient care status by communicating changes and progress to patient, family members and healthcare team (ICU nurse, doctor, staff, etc.) regarding such things as medications and side effects, etc.	5	☐	☐	☑	☑

Works as a team player by providing support or relief for other staff as needed.	5	☐	☐	☐	☑
Acts as a preceptor for new staff by providing unit orientation & continuing education for students and employees, supports activities for making new personnel feel welcomed and important.	4	☑	☐	☑	☑
Address issues and concerns relevant to the practice and profession of nursing by consulting with institutions or associations for advice and counsel.	4	☐	☐	☑	☑
Adhere to JHMH policy and procedure for patient care by maintaining a ratio of patients to one nurse depending on acuity.	4	☐	☑	☐	☑
Applies time mangmt skills to prioritize daily functions/tasks by revising plans of care, assisting others, providing for unit equipment organization/maintenance, & other tasks that facilitate unit workflow.	4	☐	☑	☑	☑
Complete basic work forms (computerized/hard copy) by populating or locating information in such documents as transfusion, specimen log book, clinical institute withdrawal assessment for alcohol, non-DKA insulin protocol, etc. as appropriate to each unit.	4	☑	☑	☑	☑
Complete discharge for patients by reviewing procedure, medication, discharge instruction form and follow up visits creating information/education packet for patient.	4	☐	☑	☑	☑
Complete patient assessments by cndctg admit interviews, complete systmtic physical assmt & interpret available data incldg med history/current med status/vital signs/lab work/x-rays/other diagnostic tests/fncial/spiritual/ psych/physio/social & age need	4	☐	☑	☑	☑
Coordinate patient stays by discussing patient status with case manager and/or utilization coordinator.	4	☐	☐	☐	☑
Delegates work to other team members as needed by evaluating team, assessing patient needs, assigning the right task to right	4	☐	☐	☐	☑

person, monitoring work completed, etc.					
Develop and promote health improvement programs by instructing individuals, families and other group on topics such as health education, disease prevention and childbirth and help them plan & implement programs to improve overall health of communities.	4	☐	☐	☑	☑
Directs & supervises less skilled nursing or health care personnel or supervise a particular unit by coaching/assisting & providing feedback in areas such as developing accurate/thorough doc skills & following policies/procedures for patient charting.	4	☑	☐	☐	☑
Ensures patient safety by implementing patient positioning requirements while maintaining proper body alignment for all types of surgical procedures.	4	☐	☐	☑	☑
Maintains clean/safe hospital/patient environment by assisting housekeeping with room cleaning such as removing debris, spills, unclean bed linens, etc.	4	☐	☐	☐	☑
Maintains prof. dev. by attending 50%+ of dept staff meetings, sign minutes of mtgs not attended, maintain up-to-date CPR, safety trng & TB tstng, cmplte annual/critical competencies identified for assigned dept, stays aware of changes/advances in field.	4	☑	☐	☑	☑
Manages medical equipment to carry out patient regime by locating, operating and caring for (including minor troubleshooting) of things such as tourniquets, cauteries, drills, telemetry, etc. as needed to meet patient needs.	4	☑	☐	☑	☑
Participates in professional development programs by actively pursuing cont ed & certifications, unit/mandated in-services, patient conferences, &/or annual workshops in areas such as disease processes, medications, & treatments.	4	☑	☐	☑	☐
Prepares for annual performance evaluation conference by submitting completed skills lists, education attendance	4	☑	☑	☐	☐

documents and self-evaluation to Clinical Manager the month prior to evaluation date.					
Promotes resolution of concerns and conflict by routing through correct mechanism or resolving the situation.	4	☐	☐	☐	☐
Respond to volatile/aggressive patient, family, visitor by initiating call to health team and/or security for assistance.	4	☐	☐	☐	☑
Run tests on Crash carts and refrigerators by making sure temperature for meds and juices is maintained, check print outs and change O2 tanks, etc.	4	☐	☑	☐	☑
Serves patients in an ethical and confidential manner by keeping all records private and handling both patient and non-patient issues in a manner that adheres to JHMH's policies and procedures.	4	☐	☐	☑	☑
Administers local, intravenous, & other anesthetics and applies healthcare devices such as bandages, splints, by assessing patient needs based on injury, size, age, etc. & following instructions for using medical equipment/supplies.	3	☑	☑	☐	☑
Collects, interprets, and communicates all appropriate patient data & anticipates changes by reviewing pertinent findings with anesthesia or other healthcare professionals.	3	☑	☑	☑	☑
Maintain updates on bed boards, census & assignment by checking Operating Room schedule against existing patient census.	3	☑	☑	☐	☑
Offer options and alternatives for medical care by referring students or patients to specialized health resources or community agencies furnishing assistance.	3	☐	☑	☐	☐
Perform administrative and managerial functions, such as taking responsibility for a unit's staff, planning, and long-range goals.	3	☐	☐	☐	☑
Perform physical examinations, make tentative diagnoses, and treat patients en route to hospitals or at disaster site triage centers.	3	☑	☑	☐	☑

Populate daily nursing record form in triage paperwork by inserting written notes regarding issues of focus/concern.	3	☐	☑	☐	☑
Seek out current nursing updates and applications regarding specific patient care practices by engaging in research activities related to nursing.	3	☐	☑	☑	☑
Serves as a mentor/preceptor, participating in QI (quality initiative) activities & completing monitors (such as crash cart checks), cost containment initiatives, new product/equipment evals & failed equipment reporting.	3	☐	☑	☐	☑
Support ongoing professional development of nursing staff by providing or arranging for training or instruction of auxiliary personnel or students.	3	☐	☑	☑	☐
Works with overflow issues such as limited bedding by communicating with house supervisor, verifying admissions & discharges.	3	☐	☑	☐	☑
Maintain and check product supplies daily by checking forms and supply area and order products based on space and storage area.	*2*				
Provide medical support in locations such as schools, hospitals, and industry by providing health care, first aid, immunizations and assistance in convalescence and rehabilitation.	*2*				
Sets up home health care and communication processes by contacting external health care service providers & discuss patient needs & case issues.	*2*				
Adheres to patient safety policies by complying w/ surgical site verifctn & time-out policies, review planned procedure & verify surgical consent w/patient, surgeon privileges & surgical assistant needs, & equipment function & inspects for safety.	*1*				
Complete basic work forms by populating or locating information in such documents as Tissue Exam Request, Autoclave, Implant Log Sheet, OR Nurse Report, Operative Antibiotic Administration Form, Time Out Forms.	*1*				

Implements surgical safety by cmplting all counts accurately, verify item sterility prior to intro onto sterile field, provide appropriate shielding from x-ray for patient & surgical team, monitors sterile field for break/potential breaks in sterility.	*1*				
Sets up operating area by preparing rooms, sterile instruments, equipment and supplies, and ensuring that stock of supplies is maintained.	*1*				
Support surgeons during operations by handing items to surgeons, informing physician of patient's condition during anesthesia, etc.	*1*				
Importance Sum		120	118	122	219
Skill Percent		47.4	50.9	49.1	89.5