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MULTISKILLED HEALTH PRACTITIONERS: RESULTS OF A GRADUATE ASSESSMENT

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**Abstract:** To ascertain the assimilation of graduates into multiskilled practice, the Add-A-Comp<sup>®</sup> Program, Methodist Hospital of Indiana, conducted an assessment of graduates over a 30-month period. Input was received both from the program's graduates and supervisors of the graduates. Of the 40 responding graduates, 24 (60%) had functioned in a multiskilled capacity. The majority of graduates reported increased job satisfaction, security, challenge, opportunities, and perceived value to their employer resulting from their multiskilled employment, with 58% receiving additional compensation for multiskilled functioning. Of the 24 supervisor respondents, 92% felt that their multiskilled graduates' knowledge and competency levels had met their expectations and that the sponsorship was worth the investment. Many of the Add-A-Coup' modules utilize a self-directed learning packet approach with 92% of

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The need for health workers **with** skills from multiple areas, is a topic which has generated considerable attention over the past **two** decades with interest and activity in this area escalating over the **past** three years. **Such** workers have been called **by** a variety of names with the most common terms being **multiskilled health** practitioner and **multicompetent health** technician (Blayney, Wilson, **Bamberg**, & Vaughan, 1989) . **Multiskilled** personnel, with their roots in industrial and business sectors, have been defined in varied ways relative to the health care delivery system, with the most recent definition provided **by** the Advisory Panel of the National **Multiskilled** Health Practitioner Clearinghouse.

The **multiskilled** health practitioner is a person who is **cross-**trained to provide **more** than one function, often in more than one discipline. These combined functions can be found in a broad spectrum of health related jobs ranging in complexity from the nonprofessional to the professional level, including both clinical and management functions. The additional functions (skills) added to the original health care worker's job **may** be of a higher, lower, or parallel level. (Vaughan, **Bamberg**, **Blayney**, & Wilson, 1989, p. 15).

Examples of such workers include **radiologic** technologists performing ultrasound scans, nurses doing insurance coding, admitting clerks performing phlebotomy for admission laboratory procedures, central supply technicians doing specimen processing, nurse aides performing

physical therapy aide tasks, and pharmacists managing both the pharmacy and clinical laboratory (Bamberg, Blayney, Vaughan, & Wilson, 1989).

Historically, the need and use of **multicompetency** or **multiskilled** health workers emerged predominantly from rural hospitals and physicians' offices. Such health care settings often trained local residents to perform limited, basic functions in a variety of areas such as business office, medical records, insurance processing, **specimen** collection, and laboratory and pulmonary procedures to meet the needs of their clientele and services offered. Some facilities/providers trained already-employed personnel such as medical assistants or nurses for added skills in various allied health areas, either by on-the-job training or through formal continuing education or degree programs. Some educational institutions, such as the University of Alabama at Birmingham and Southern Illinois University at Carbondale, have attempted to meet the needs of the physician's office and rural hospital by preparing **multicompetency** practitioners with appropriate skill combinations from areas such as medical assisting, medical laboratory technology, radiography, respiratory therapy, electrocardiography, medical records, and patient education (Bamberg & Blayney, 1989; Bamberg, Blayney, Powell, Makely, & Keenon, 1990; Bamberg, Blayney, Vaughan, & Wilson, 1989; Bamberg, Vaughan, & Blayney, 1990; Blayney, et al., 1989; Keenon, 1985; Lugenbeel, 1979).

More recently the use of **multiskilled** health workers has spread to medium and large sized hospitals in urban settings. In order to meet the needs of these larger health care facilities, recent programs (with most being at the baccalaureate level and providing eligibility for two or more certifications) have produced graduates with high-level skills

by combining areas such as medical record administration and tumor registration; respiratory therapy and cardiovascular technology; perfusion and physician assisting (Bamberg & Blayney, 1984); **histotechnology** and cytotechnology; radiography and ultrasound or special imaging procedures; nursing and respiratory therapy; and dental hygiene and assisting (Bamberg & Blayney, 1989). Numerous other health care settings have begun to investigate and experiment with the use of **multicompetent** health personnel, both with basic and high-level skills, including long-term care facilities, urgent care centers, and rehabilitation facilities for the developmentally handicapped (Bamberg, Blayney, Vaughan, & Wilson, 1989; Bamberg, Vaughan & Blayney, 1990).

In order to provide background information for the establishment of training and utilization efforts, several recent research studies have examined the need for skills from multiple health areas as perceived by health care employers and practitioners. Suggested **combinations** have included radiography and ultrasound; medical laboratory technology and cytotechnology or **histotechnology**; electrocardiography and respiratory therapy; physical therapy and occupational therapy; registered nursing and physical or occupational **therapy** (Low & Weisbord, 1987); physical and occupational therapy assisting (Larsen & Stewart, 1990); **radiologic** technology or medical assisting with either electrocardiography or phlebotomy (Rudmann, et al., 1989); medical **laboratory** technology and radiography; and nursing and respiratory therapy (Beachey, 1988). Regional needs assessment conducted in Iowa (Brandt & Rzonca, 1989) and South Carolina (Hernandez & Samuels, 1990) documented the current use and need for greater numbers of **multiskilled** health workers. The Iowa study found 79% of respondent hospitals with less than 100 beds

indicating they would use more multiskilled workers if available, with a registered nurse performing respiratory therapy being the most frequently listed worker in current use. The South Carolina study of both in-patient and out-patient facilities found 47% of respondents currently using multiskilled workers with the most frequently listed skill combinations for additional workers being nursing with laboratory and respiratory therapy with electrocardiography.

#### Background for the Study

Methodist Hospital of Indiana's Add-A-Comp<sup>®</sup> (short for Add a Competency) Program was implemented in 1986. The program was developed to address the manpower needs of all sized hospitals in both rural and urban settings, with potential application to ambulatory settings including physicians' offices, clinics, urgent care centers, mobile imaging units, and health maintenance organizations. The program has been marketed predominantly to health care practitioners and employers in central Indiana, though a few students have come from distant locations.

The Add-A-Comp<sup>®</sup> Program is designed for individuals with prior training and experience in health care to acquire additional skills by completing learning modules which include both didactic instruction and clinical experiences. Didactic instruction is provided through self-directed learning packets as an alternative to traditional classroom instruction for several of the modules. The program, thus, produces multiskilled practitioners able to competently function in more than one area of health care.

Between April 1986 and November 1988, the Add-A-Comp<sup>®</sup> Program offered four modules: (a) Computerized Tomography, (b) Sonography

Techniques. Additional learning modules have been developed after 1988 including **Echocardiography** and Electroencephalograph. Subsequent to the graduate assessment, the original Electrocardiography module was renamed Cardiography and expanded to also include Helter monitoring and stress testing. Based on the nature of the request and the availability of resources, **Add-A-Comp<sup>®</sup>** program modules can be customized to meet the specific needs of individual applicants and their employers. The use of self-directed learning packets in conjunction with intensive clinical experiences makes for a flexible and cost-effective program, particularly when providing a unique module for one individual.

Using the "add-on" approach for persons already working in health care allows learning modules to be relatively short in length, minimizing the employee's time away from their employer. Limiting access of the program to already **credentialed and/or** experienced health care practitioners enables the **modules** to be condensed and highly focused on the specific knowledge and competencies needed to perform in the new skill area. For purposes of the **Add-A-Comp<sup>®</sup>** modules, it is assumed **that** entering students, as health practitioners, have basic knowledge of patient care, medical terminology, anatomy and physiology, and safety. Therefore, only advanced content in these topics as related to the new skill area is included in the specific modules.

#### Purpose of the Study

After conducting the **Add-A-Comp<sup>®</sup>** Program for more than two years, informal feedback from graduates and area employers indicated that the program was successful. Therefore, the **purpose** of this study was to formally assess **Add-A-Comp<sup>®</sup>** Program graduates to provide evaluative data for program review and revision.

The specific research questions addressed by this study are described below:

1. Do Add-A-Comp<sup>®</sup> graduates function in a multiskilled capacity by using both their former and new skills in practice?
2. What is the impact of added-skills training on Add-A-Comp<sup>®</sup> graduates' job opportunities, challenge, security, satisfaction, status, and pay?
3. What barriers or obstacles do Add-A-Comp<sup>®</sup> multiskilled graduates experience in integrating the use of their new skills into practice?
4. Are the multiskilled graduates satisfied with their Add-A-Comp<sup>®</sup> added-skills training relative to required prerequisite knowledge/background, delivery of instruction, and validation of competency?
5. Are the supervisors/employers of Add-A-Comp<sup>®</sup> graduates satisfied with the multiskilled graduates relative to knowledge and competency level as well as monetary investment?
6. From the perspective of supervisors/employers, what is the impact of employing Add-A-Comp<sup>®</sup> graduates in multiskilled capacities on the delivery of health care in their institutions relative to flexibility in staffing, cost effectiveness, availability of services, overall value, and job challenge and security for the graduates?
7. What additional Add-A-Comp<sup>®</sup> modules could be developed to meet the needs of health care supervisors/employers?

#### Limitations of the Study

The geographical homogeneity of the respondents was the main limitation of this study. The evaluative feedback received from Add-A-Comp<sup>®</sup> Program graduates and their supervisors is relevant only to

the instruction provided in this particular **multiskilled** educational program and the facilities in which they practiced upon graduation which are Methodist **Hospital** of Indiana, Incorporated predominantly, and other hospitals and health care institutions in Indiana, Illinois, Ohio, and Florida. The **study** outcomes pertain only to the limited number of states represented by the graduates.

#### Methodology

##### Population

A total of 54 **health** practitioners graduated from one of the four learning modules offered between April 1986 and November 1988. This included 14 Electrocardiography (EKG) graduates, 12 in **Sonography**, 22 in Computerized Tomography (CT), 3 from the Laboratory and **Phlebotomy** Techniques module, and 3 from customized, individual modules. Descriptive characteristics of the modules' structure and administration are displayed in **Table 1**.

All CT and **Sonography** graduates were **radiologic** technologists; while the Laboratory and Phlebotomy Techniques graduates included one dental assistant, one who was both a respiratory care technician and an emergency medical technician (EMT), and one with prior on-the-job (**OTJ**) experience in venipuncture. The 14 EKG graduates included four medical assistants, four nurse assistants, one **phlebotomist**, one EMT, one transportation escort with a baccalaureate degree in biology, and three who had worked as **OTJ-trained**, non-certified **EKG** technicians. The customized modules included one in **renal sonography** for a **radiologic** technologist, one in **venipuncture** and injecting for a surgical technician, and one in basic **sonography** for a person with prior OTJ ultrasound experience. Of the 54 graduates during the 30-month study

period, 36 sponsored to attend an Add-A-Comp<sup>®</sup> Program module by their employer with 22 of these being from Methodist Hospital of Indiana, Incorporated.

Table 1

Design of Modules

Module <sup>a</sup>	Length In Weeks	Capa- city Per Class <sup>b</sup>	Classes Per Year	Tui- tion Fee	Book Fee	SDL Pkt <sup>c</sup> Used	Lecture Used <sup>d</sup>	Cert- ifica- tion Eligi- bility
	n	n	n	\$	\$			
EKG	3	4	4	300	30	Yes	Yes	NBCVT EKG tech- nician
SONOGR	16	2	3	1000	235	Yes	No	ARDMS diag- nostic medical sono- grapher
CT <sup>e</sup>	12	2	4	750	0	Yes	No	None Avail- able
L & P Tech	12	4	1	400	25	No	Yes	CIMLE phlebo- tomist

<sup>a</sup>EKG = Electrocardiography; SONOGR = **Sonography**; CT = Computerized Tomography; L & P Tech = Laboratory & Phlebotomy Techniques.

<sup>b</sup>Capacity is external students only, CT module can accommodate additional internal Methodist Hospital of Indiana students.

<sup>c</sup>DL Pkt = Self directed learning packet.

<sup>d</sup>All modules include relevant clinical experiences.

<sup>e</sup>Requires training as a **radiologic** technologist for entry.

The research instruments consisted of two questionnaires developed to collect information regarding employment and subsequent **credentialing** of graduates, feedback on the educational process itself, the resulting competency levels and functioning of graduates, and the benefit to **employers** of the **multiskilled** personnel. One instrument, titled Graduate Questionnaire, was designed to survey the **Add-A-Comp<sup>®</sup>** graduates. A second instrument, titled Supervisor Questionnaire, was designed for the graduates' supervisors. The survey items were unique to each questionnaire.

First drafts of both research instruments were developed by the **Add-A-Comp<sup>®</sup>** Program Director. The drafts were reviewed **by** the Graduate Assessment **Panel** which consisted of the Department Head for **Connelly** Allied Health Education Center, the **Add-A-Comp<sup>®</sup>** Program Director, and five faculty who teach in various **Add-A-Comp<sup>®</sup>** modules. The composition of the Panel by professional background included two **radiologic** technologists, one medical technologist, one electrocardiography technician, one nurse, one diagnostic medical **sonographer**, and one combined respiratory therapist and paramedic. Two additional, revised drafts of both questionnaires were developed by the Panel with 100% consensus being reached on all items included in the final version of both research instruments- Due to time constraints and the need to **obtain** the survey information to incorporate curriculum revisions before the next **cycle** of **Add-A-Comp<sup>®</sup>** module offerings, neither **questionnaire** was pilot tested.

Graduate Questionnaire. The Graduate Questionnaire consisted of 11 items of varying response formats (yes, no; three-point **Likert** scale;

fill in the blank; and free response) and was designed to address research questions (1), (2), (3), and (4) presented under Purpose of the Study. The only demographic information requested from the graduates was their current address to update Add-A-Comp<sup>®</sup> alumni records. The 11 Graduate Questionnaire items are described below.

1. The graduates were asked to list the following information for each job held since completing an Add-A-Comp<sup>®</sup> module: employer name and address, job title/position, supervisor's name and telephone, whether they used only the new or both prior and new skills, and permission for their supervisor to be contacted (for each position listed).

2. If the graduate had held any jobs where they had functioned in a multiskilled capacity, they rated the(se) job(s) (in composite) as to whether the following aspects of their job(s) had increased, stayed the same, or decreased as a result of multiskilled functioning: job opportunities, challenge, security, satisfaction, status (promotion), income (wages/pay), and perceived value to employer.

3. Graduates who functioned in a multiskilled capacity were requested to indicate if they were paid more than their single-skilled coworkers, (yes/no/not sure response format) and, if yes, the amount of additional compensation.

4. Credential attempts and the results for the new skill area were requested.

5. Any restrictions (licensure laws, scope of practice acts, liability concerns, etc.) which impeded or limited the use of their new skills were listed.

6. The graduates were asked whether the training and experience prior to entering the Add-A-Comp<sup>®</sup> module was appropriate background for the module (yes/no response format).

7. The graduates were requested to indicate whether the

certificate of completion provided by Methodist Hospital of Indiana was accepted by their employer as adequate verification of the training and experience they received in the Add-A-Comp<sup>®</sup> Program (yes/no/not sure response format).

8. The graduates were asked to rate several aspects of the instruction they received in the Add-A-Comp<sup>®</sup> Program module. Each aspect was rated on a three-point scale of excellence (1) satisfactory, (2) unsatisfactory, and (3) with a "not applicable" option included. The instructional aspects rated included: curriculum topics, classroom instruction, self-directed learning packet, clinical instruction] supervision, audiovisual aids, text/reference books, sequencing of content, length of module, amount of clinical time, overall organization of module, coordination of theory and practice, admissions process, tuition fee, book fee, tests and clinical rating/check-off instruments, and overall quality of the learning experience.

9. If the graduates had practiced their new skills, they were asked to indicate whether the Add-A-Comp<sup>®</sup> module provided an appropriate level of knowledge and competency (yes/no/not sure response format).

10. The graduates were asked if they would recommend the Add-A-Comp<sup>®</sup> Program to others (yes/no/not sure response format).

11. An open-ended section was included for any additional comments the graduates chose to provide.

Supervisor Questionnaire. The Supervisor Questionnaire consisted of eight items designed to address research questions (5), (6), and (7) which are presented under Purpose of the Study. The eight items are described below.

1. Supervisors of graduates who had been sponsored financially by their organization to attend an **Add-A-Comp<sup>®</sup>** module were asked to indicate whether the **Add-A-Comp<sup>®</sup>** training and experience was satisfactory, if the graduate's resulting knowledge and competency level met the organization's expectations, whether the sponsorship was worth the financial investment, and whether their organization would sponsor other employees to attend an **Add-A-Comp<sup>®</sup>** Program module (yes/no/not sure response format).

2. Supervisors of graduates who had not been sponsored by their organization were asked if the **Add-A-Comp<sup>®</sup>** training and experience were satisfactory, and whether they would hire other graduates of the **Add-A-Comp<sup>®</sup>** Program in the future (yes/no/not sure response format).

3. All supervisors were asked whether the graduate used both their prior skills and the new skills acquired in the **Add-A-Comp<sup>®</sup>** Program (i.e., had functioned in a **multiskilled** capacity) (yes/no response format).

4. If the graduate had worked as a **multiskilled** employee under their management, the supervisor was requested to indicate if the **multiskilled** graduate was provided additional pay, and if the organization had incurred a financial savings due to the **multiskilled** functioning of the graduate (yes/no/not sure response format).

5. Supervisors of **multiskilled-functioning** graduates were asked to indicate the changes resulting from the **multiskilled** graduate by rating each of the following items as increased, remained the same, or decreased: flexibility in staffing, overall **laborcosts**, number of patient services offered by organization, value of graduate to the organization, ability to justify the full-time employment of the

graduate, quality of care provided by **the** graduate, and **the** graduate's job security, challenge, **and** satisfaction. **An** open-ended section was included for supervisors **to** indicate any additional effects, positive or negative, resulting from the graduate's **multiskilled** functioning.

6. All supervisors were asked to indicate whether they supported the concept of increased pay for **multiskilled-functioning** employees (yes/no/not sure response format).

7. Supervisors were asked to designate future additional **Add-A-Comp<sup>®</sup>** modules **they would** like to see developed.

8. A final open-ended section was included on the Supervisor Questionnaire for any additional comments they wished to provide.

#### Data Collection

In November 1988, the 54 **Add-A-Comp<sup>®</sup>** Program graduates **to date** were contacted. A packet was sent to each graduate with a cover letter from the program director soliciting their participation in the study. In addition to a copy of the Graduate Questionnaire and the cover letter, packets also included a self-addressed, postage-paid return envelope and a copy of the Supervisor Questionnaire. The graduates were provided a copy of the Supervisor Questionnaire to demonstrate the non-threatening nature of the instrument and thus, hopefully, enhance the likelihood of them giving permission for their supervisors to **be** contacted. One month **later** a second mailing was sent to graduate non-respondents. Follow-up telephone calls to those **who** did not return their completed questionnaires were made two weeks after the second mailing.

Between **late** December 1988 and mid-January 1989 packets were sent to those individuals who had supervised graduates after completing the **Add-A-Comp<sup>®</sup>** Program. The packets included a cover **letter** from the

program director soliciting their participation, a Supervisor Questionnaire, a descriptive **Add-A-Comp<sup>®</sup>** Program brochure, and a self-addressed, postage-paid return envelope. Packets were sent to 23 supervisors including all **Methodist** Hospital of Indiana supervisors who had managed **Add-A-Comp<sup>®</sup>** Program graduates and external supervisors for whom permission to contact had been provided by the graduates. No follow-up mailings or telephone calls were made to non-respondent supervisors due to time and fiscal constraints.

#### Data Analysis

All data from the Graduate and Supervisor Questionnaires were entered and analyzed by the Apple **ASTAT** software package. Data were analyzed only for frequency and percentage distributions with no parametric or **nonparametric** statistics being performed. All variables were analyzed in aggregate and cross-tabulated by learning module completed. Due to the small number of surveys returned per individual learning module, the vast majority of results are reported in aggregate. For purposes of data analysis, the **Add-A-Comp<sup>®</sup>** Program was the independent variable while all the impact information obtained from the two questionnaires served as the dependent variable.

#### Results

Completed questionnaires were returned by 40 graduates for a graduate response rate of 74%. **Almost all** graduates (90%) gave permission for a Supervisor Questionnaire to be sent to their supervisor(s) and provided the name and mailing address for the supervisor(s).

Of the 23 supervisors, 18 (78%) returned completed **questionnaires** concerning their management of **Add-A-Comp<sup>®</sup>** graduates. Several

supervisors **had** managed more than one graduate. **Some** supervisors who had managed multiple graduates completed individual questionnaires on each graduate while others chose to complete one questionnaire on several graduates as a composite of their experience. The 18 supervisors returned a total of 24 Supervisor Questionnaires, providing information on 41 (76%) of the graduates. **All** findings from the **survey** of supervisors are presented in terms of numbers and percentages of completed questionnaires (n = 24) rather than the number of supervisors who responded.

### Reliability

Based on the 40 graduate and 24 supervisor completed questionnaires, overall **Cronbach** Alpha values as a measure of inter-item consistency were calculated for both instruments using common **response-**format groupings. The Graduate Questionnaire had a **Cronbach** Alpha of .78 and the Supervisors Questionnaire had a **Cronbach** Alpha of .67.

### Graduate Survey Results

Of the 40 graduates who responded, none had completed the Laboratory and Phlebotomy Techniques module, eight (20%) had completed the EKG module, 12 (30%) the **Sonography** module, 17 (42%) the computerized **Tomography** module, and three (8%) had completed **custom-**designed modules. Thirty-five graduates (88%) indicated they had used the new skills gained in the **Add-A-Comp<sup>R</sup>** module they completed in one or more jobs. Of the 40 graduates, 24 (60%) had used both prior and new skills (functioned as a **multiskilled** practitioner) in one or more positions.

Table 2 lists graduate perceptions of changes in seven job-related aspects as a result of functioning in **multiskilled** capacities for the 24 graduates having been employed as **such**. Over 80% of the multiskilled-

Table 2

Graduate Perceptions of Changes in Job-Related Aspects Due to Functioning as a Multiskilled Practitioner (N = 24)

Job Related Aspect	<u>Change in Job Functions/Status</u>					
	Increased		Remained the Same		Decreased	
	n	%	n	%	n	%
Job opportunities	21	88	3	12	0	
Job challenge	24	100	0		0	
Income (pay/wages) <sup>a</sup>	14	58	5	21	1	4
Job security	23	96	1	4	0	
Job satisfaction	23	96	0		1	4
Job status (promotion)	14	58	10	42	0	
Perceived value	23	96	1	4	0	

<sup>a</sup>Four (17%) were not sure whether they were being paid more.

functioning graduates reported a positive change in all aspects of job functions/status except income (pay) and status (promotion). Slightly over half (58%) of such graduates reported an increase in job status (promotion) and pay.

Seven of the 40 responding graduates (8%) had been successful in becoming credentialed in their new skill area. These respondents represented 100% of those who had attempted credentialing and knew the results. Five of the seven were certified as diagnostic medical sonographers by the American Registry of Diagnostic Medical Sonographers, and two as EKG technicians by the National Board of

Cardiovascular Testing. Thirty-four graduates (85%) felt they had the competency level necessary for a job in their new skill area. *Journal of Health Occupations Education, Vol. 6 [1991], No. 1, Art. 4*

Thirty-six of the 40 respondents (90%) **reported** having encountered no restrictions or obstacles to using **the** new skills. Thirty-three (82%) indicated the certificate of completion from Methodist Hospital was accepted by employers as adequate verification of the training and experience received in the program.

The graduates were asked to rate various aspects of their learning experience. Some aspects were not applicable to **all** modules and graduates. Therefore, the percentages are based **on** the **number** of respondents rating a given aspect. Thirty-five of the **40** respondents (88%) reported the training and occupational experience they had prior to entering the **Add-A-Comp<sup>®</sup>** Program was appropriate background for their module, and **that** they would recommend the program **to** others. Over 75% of respondents gave a rating of at least satisfactory for the following aspects of their learning (with over 80% of these ratings being satisfactory as opposed to excellent): topics included in the curriculum, classroom instruction, clinical instruction and supervision, videotapes and other audiovisual aids, text and reference books, module sequencing, overall module length, **amount** of clinical time, overall organization of the module, coordination of theory with practice, admissions process, tuition fee, book fee, quizzes/test/clinical checks, **and** overall quality of the learning experience. For those graduates having used **self-directed** learning packets, 92% gave this instructional approach a rating of at least satisfactory.

Positive, negative, and neutral comments were received from graduates in the open-ended section of the Graduate Questionnaire.

Noteworthy is that two EKG graduates were displeased because they could not meet a minimum typing requirement for a job as an EKG technician since typing was not part of the Add-A-Comp<sup>®</sup> module. Another EKG graduate reported receiving a letter of recommendation from her employer for having recognized a "dangerous arrhythmia" and notifying a physician in time. Some graduates of the Sonography module suggested that the four-month instructional period be lengthened. Another graduate reported increased job security when her hospital merged with another local facility resulting in reductions in the workforce. Fifteen of the 17 graduates (88%) of the Computerized Tomography module reported multiskilled jobs using their prior radiographic skills as well as their new CT skills with 10 stating that they were being paid more than those radiographers without CT skills.

#### Supervisor Survey Results

Of the 24 questionnaires returned by the supervisors of Add-A-Comp<sup>®</sup> Program graduates, 12 respondents (50%) supervised graduate(s) who had been financially sponsored to attend the program by their institutions. Of these 12, 11 (92%) indicated that the training and experience received by the graduate while in the program as well as the graduate's knowledge and competency level were satisfactory to the supervisor and others in their organization, and that the final result of sponsorship was worth the investment. No questionnaires reported dissatisfaction, lack of competence/knowledge, or that the result was not worth the investment. One supervisor was not yet sure of the benefit/worth of the institution's sponsorship. Ten respondents (83%) indicated that, based on the sponsorship experience, the supervisor's organization would be likely to sponsor other Add-A-Comp<sup>®</sup> Program enrollees in the future.

One organization, unlikely to sponsor a student again in the future, indicated that the graduate had completed a custom-designed module representing a temporary need. A second respondent indicated that future sponsorship would be unlikely unless manpower needs of the organization changed in the future.

Twelve respondents indicated that **the** graduate(s)' attendance in the program was not sponsored by the supervisor's organization. Eleven of these 12 (92%) indicated that the graduate's knowledge and competency level were satisfactory to the supervisor and others in their organization. One (a%) was not yet sure. Twelve of the questionnaires (100%) indicated **that** the organization **would** consider hiring other Add-A-Comp<sup>®</sup> Program graduates in the future.

Supervisors who had managed Add-A-Comp<sup>®</sup> graduates functioning in a **multiskilled** capacity, were asked to indicate whether nine different job-related aspects had increased, decreased, or remained the same as a result of **multiskilled training/functioning**. The data are presented in Table 3.

Over 70% of supervisor respondents reported an increase in flexibility of staffing, job security and **value** of the graduate for the organization, job challenge and job satisfaction for the graduate, and quality of care provided. **Two** respondents indicated a decrease in overall labor costs while ten reported that labor costs remained the same. The additional compensation provided **by** some organizations may have negated potential cost savings. One respondent indicated an increase in the number of patient services offered **and** nine reported an increase in their ability to justify full-time employment of **the** graduate due to **multiskilled** functioning.

Table 3

Supervisor Perceptions of Changes in Job-Related Aspects Resulting From  
Employment of Graduates as Multiskilled Practitioners (N = 15)

Job-Related Aspect	<u>Change in Job Functions</u>					
	Increased		Remained the Same		Decreased	
	n	%	n	%	n	%
Flexibility in staffing	13	87	2	13	0	
Overall labor costs	3	20	10	67	2	13
Number of patient services offered by organization	1	7	14	93	0	
Job security of graduate at this organization	11	73	4	27	0	
Value of graduate to organization	14	93	1	7	0	
Job challenge for graduate	15	100	0		0	
Job satisfaction for graduate	14	93	0		1	7
Supervisor's ability to justify full-time employment of graduate	9	60	6	40	0	
Quality of care provided	11	73	4	27	0	

resulted in a financial savings to the organization, seven (47%) were not sure, five (33%) indicated no, and three (20%) indicated yes. **The** eight supervisors who reported an increase in **pay** for **multiskilled-**functioning graduates stated that increases were **due to** having more responsibility and/or having cross-trained into a higher paying job (e.g., radiography into **sonography**). Increased compensation for **multiskilled** employees ranged from an additional \$0.65 to \$2.50 per hour. One supervisor stated that being **multiskilled** is a ". . . part of current job description and that as such an expectation of the job." When supervisors were asked if they support the concept of increased pay for **multiskilled** employees who function in that **capacity**, 21 (88%) said yes and three (12%) were not sure.

When asked what other skill areas supervisors would like to see included in future **Add-A-Comp<sup>®</sup>** modules, those **listed** most frequently were magnetic resonance imaging, Doppler **sonography**, vascular **sonography**, **echocardiography**, and mammography. Some supervisors indicated a problem they had encountered with **multiskilled employees** being the desire of the graduate to perform only in the new skill area and not in prior skill areas. One supervisor stated, "With many it seems that instead of becoming **multiskilled** they merely drop **old** skills for new." Another stated, "The major problem we have had with putting technologists in **multiskilled** responsibility roles is that they feel they are a 'CT tech' and do not want to work in any other area."

For both the Graduate and Supervisor surveys, no noteworthy results were obtained when the data were analyzed by learning module. **No** unique results were of consequence to graduate outcomes for any particular

module. The small number of respondents per individual module (n = 0 to 17) may have limited the presence of results unique to particular Add-A-Comp<sup>®</sup> modules.

#### Discussion

Any generalizations which can be drawn from this study concerning the success of the Add-A-Comp<sup>®</sup> Program graduates as multiskilled health practitioners are limited by the cumulative response rate (58 of 77, or 75%) and the instrument design. As interviewing of a random sample of non-respondents was not done, the overall positive response received from the respondents may represent a potential bias (halo effect) by only those with a positive reaction completing the survey. One may assume, though, the results are relatively valid and unbiased since some negative comments were also received and evaluative feedback came from both Add-A-Comp<sup>®</sup> graduates and supervisors of graduates. The fact that some supervisors completed separate questionnaires on each graduate they managed while others completed one questionnaire on multiple graduates, reflected a lack of clarity in the Supervisor-packet explanatory letter and complicated the data analysis. A clearer indication of the impact of Add-A-Comp<sup>®</sup> multiskilled graduates on health services delivery could have been obtained if all supervisors completed a separate Supervisor Questionnaire on each graduate they managed, thus, allowing more refined data analysis relative to the individual learning modules. The use of an unsatisfactory/satisfactory/excellent response format for rating various aspects of the instruction received in the Add-A-Comp<sup>®</sup> Program modules may have provided an inadequate level of differentiation and resulted in the high percentage of satisfactory as opposed to excellent ratings.

Additionally, there was no participation in the study by graduates of the Laboratory and Phlebotomy Techniques module and only limited participation by graduates of the Electrocardiography module and their supervisors. The results, therefore, reflect predominantly the addition of computerized tomography and ultrasound skills for multiskilled practice. Data were collected relative to the Add-A-Comp<sup>®</sup> graduates only and did not include information on size and location of the employing institutions. This prevented data from being analyzed by institutional characteristics.

Of the 36 graduates sponsored to attend the Add-A-Comp<sup>®</sup> Program by their employers, 22 were sponsored by Methodist Hospital of Indiana and 14 were sponsored by external organizations. Several of these external organizations were hospitals and physician group practices associated with Methodist Hospital of Indiana in some manner. Many of these organizations have sent additional employees to the program to be cross-trained and this may be interpreted as an indication of acceptance of the program by area employers.

In most cases, Add-A-Comp<sup>®</sup> students were sponsored to add new skills for future employment only in the new skill area, e.g., radiographers adding CT skills. However, 60% of graduates have been utilized in multiskilled capacities. This practice appears to be increasing at Methodist Hospital of Indiana only within sub-divisions of departments and not across departmental lines. This is not surprising given the fact that Methodist Hospital of Indiana is a 1120-bed, tertiary care hospital with more than 7000 employees and a highly specialized departmental structure.

The Add-A-Comp<sup>®</sup> Program appears to be successful based on the findings of the Graduate and Supervisor surveys. For the most part,

graduates and their supervisors were satisfied with knowledge and skill levels acquired from attending the program; and those institutions which sponsored employees to attend, indicated they are likely to do so again. Multiskilled functioning increased the graduates' perceived value to their employers as well as job status, challenge, satisfaction, security, and opportunities, with over half receiving additional pay for their added skills. Use of self-directed learning packets appears to be a viable alternative to traditional, classroom-based education. While some graduates preferred more instructional time, in general the lengths of the modules appear appropriate.

#### Conclusions

In response to the study's research questions, the findings from the Graduate Questionnaire and Supervisor Questionnaire support the conclusions staked below:

1. The majority of Add-A-Comp<sup>®</sup> graduates (60%) function in a multiskilled capacity by using both their former and new skills in practice.
2. The majority of Add-A-Comp<sup>®</sup> graduates functioning in a multiskilled capacity (> 50%) report a positive impact on job functions/status relative to job opportunities, challenge, security, satisfaction, promotion, and pay.
3. Barriers/obstacles in integrating the use of their new skills into practice are experienced by less than 10% of Add-A-Comp<sup>®</sup> graduates with a reported barrier/obstacle being organizational structures that do not facilitate use of employees across departmental lines.
4. The Add-A-Comp<sup>®</sup> multiskilled graduates are satisfied with their added-skills training with over three-fourths of respondents providing a

positive evaluation of the program's required prerequisite knowledge} experiences, instruction, and competency validation.

5. The supervisors/employers of Add-A-Comp<sup>®</sup> graduates are satisfied with the program's multiskilled graduates relative to knowledge/competency level in the added skills and monetary investment as dissatisfaction in these areas was not expressed by the supervisor of any Add-A-Comp<sup>®</sup> graduate.

6. The impact on delivery of health care by employing an Add-A-Comp<sup>®</sup> graduate in a multiskilled capacity is substantial as over 70% of supervisors indicated an increase in staffing flexibility, quality of care provided, value of graduate to organization, and job security, challenge, and satisfaction for the graduate. The cost-effectiveness impact of multiskilled functioning by the Add-A-Comp<sup>®</sup> graduates is less positive with 20% of supervisors reporting financial savings to their institution and 47% being unsure, though the additional pay given many of the multiskilled graduates may have negated potential cost savings.

7. The development of additional Add-A-Comp<sup>®</sup> modules in the areas of magnetic resonance imaging, Doppler sonography, vascular sonography, echocardiography, and mammography could help meet the needs of health care supervisors/employers.

The findings from this study clearly indicate a demand for multiskilled health practitioners. The results of the first Add-A-Comp<sup>®</sup> Program graduate assessment study demonstrate acceptance of the program by area employers and health care practitioners. The module approach appears to be successful in preparing confident, competent practitioners for multiskilled practice. This will need to be evaluated periodically

during the next several years as health care employers face inevitable cost reduction challenges.

#### Implications and Action

There have been several developments in the **Add-A-Comp<sup>®</sup>** Program since the graduate assessment study was conducted, most of which were initiated due to findings from the study. Three of the modules have undergone or are in the process of undergoing revision. The Electrocardiography module is being expanded to include stress testing and Helter monitoring. It is now called the Cardiology module with a seven week learning experience and certification eligibility in Cardiology by Cardiovascular Credentialing International (CCI). The learning packet for the Computerized Tomography module is also being updated and the learning period extended from 12 to 16 weeks. Two new modules have been added based on requests from area employers, **Echocardiography** and **Electroencephalograph (EEG)** which are both 16-week modules incorporating learning packets and intensive clinical experiences. The Laboratory and Phlebotomy Techniques **module** has been temporarily discontinued due to some controversy among laboratory professionals in Indiana regarding the different levels of personnel and the appropriate assignment of laboratory procedures to support **multiskilled** personnel. This needs to be resolved before the Laboratory and Phlebotomy Techniques module can be revised appropriately. Under consideration for development in the near future are modules in Magnetic Resonance Imaging, Physical Therapy Aide, and Mammography.

#### Recommendations

More research is needed **among Add-A-Comp<sup>®</sup>** Program graduates and their supervisors over time to answer such questions as: What are the

cost-savings in numerical amounts from employing **multiskilled** practitioners? Does added compensation motivate **multiskilled** health practitioners to use both prior and new skills as opposed to just new skills? What effect, if any, is there over time on topics such as length-of-service/retention, job-related burn out, job satisfaction, etc. , when employed in a **multiskilled** capacity? What implications are there for issues relating to scope of practice, competency verification and maintenance, and **credentialing**? Are **multiskilled** practitioners one answer to addressing personnel shortages? Information gained from such studies should be compared with that from other educational **programs** and employment sites across the country.

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