

Feature

The Importance of Urinalysis

by Donald S. Young, MD, PhD, Director, William Pepper Laboratory, Hospital of the University of Pennsylvania, Philadelphia

In 1637 Thomas Brian wrote, "*There is no judgment of diseases to be given by the urine alone; that the physician ought not to give judgment of the urine, before he have strictly examined how the sicke partie is affected.*" Prior to Brian's admonition, greater emphasis was commonly placed on the crude examination of the urine than on obtaining a proper history and performing a thorough examination of the patient. Brian put the examination of urine - **urinalysis** - in the context by which it is still viewed today: an important *adjunct* to the workup of a patient's problem.

Nearly 2 centuries later, in 1827, the English physician Richard Bright introduced urinalysis as part of the routine examination of a patient. Bright emphasized using both macroscopic and microscopic examination of urine to diagnose renal diseases, a view later reinforced by the American physician Thomas Addis, who refined the microscopic examination technique.

Whereas the early investigators advocated using urinalysis solely for the workup of renal diseases, physicians today also tend to use urinalysis to screen for diseases of other organ systems. With the method of testing being a single, simple dipstick, urinalyses may now be performed well by relatively less skilled individuals. In fact, in many clinical practices only dipstick tests are performed. Nevertheless, the microscopic examination can be critically important in the examination of diseases of the urogenital tract. In many situations the microscopic examination enables discrimination of diseases of the lower urinary tract from renal diseases, and often enables determination of the type and activity of the renal disease.

Types of Specimens

It is important to obtain the appropriate specimen, to optimize the information needed for diagnosis of a patient's disease. The **first morning specimen**, which is the most concentrated, is preferred for examination of both chemical and microscopic components, although some microscopic elements may be destroyed with prolonged standing in the bladder. To minimize the destruction of cells, a **second-voided specimen** may be examined. This is a specimen collected some time after the first morning specimen, at a time when the urine is still relatively concentrated, but without standing in the bladder for an excessive period of time. The **postprandial specimen**, a variant of this type of specimen, is collected after a meal with the primary objective of detecting glucose. However, in the presence of gross abnormalities, a **random urine specimen** will often suffice for examination. In outpatient practice, this specimen is often the most convenient for both physician and patient.

A **2-hour specimen** collected in the afternoon is traditionally used for the semiquantitative measurement of urobilinogen, since urobilinogen is relatively unstable and undergoes considerable circadian variation. Because of the circadian variation in excretion of many components of urine, largely due to the influence of meals, posture and activity, the **collection of all urine over 24 hours** is required for accurate quantitation of the excretion of substances in urine. When such collections are made, appropriate preservatives should be added to the urine. Recommended preservatives for the different components of urine are listed in the major textbooks of laboratory medicine and in the catalogs of the large reference laboratories.

If a urine specimen is to be examined for bacteria or other microorganisms, a **clean-catch specimen** should be examined. After the external genitalia have been cleaned, the technique for which is well described in documents and illustrated in videotapes from the National Committee for Clinical Laboratory Standards (NCCLS),^{1-3*} the first portion of passed urine is discarded and the next portion is collected in a sterile container for culture, and determination of sensitivities of the organisms, if necessary.

When testing urine for formed elements or organisms, the examination should begin within 30 minutes of specimen collection. Examinations should not be performed if they cannot be done within 2 hours of the passage of the specimen.

*The NCCLS videotapes (references 2 and 3) are available through the Becton Dickinson Media Center. Call 800-ALL-MEDIA

Gross Examination

A **visual inspection** of the urine should be included as part of all urinalyses. The *color* of the urine gives a simple indication of the concentration of the solutes present. The urine color should be recorded. Abnormal colors are often due to medications, foods or dyes, although blood may make the urine red, and brownish urine may be due to bile pigments.

The specific gravity of a urine specimen provides a more quantitative measure of the concentration of a urine specimen, and is influenced by the amount of fluid and solute ingested, the action of antidiuretic hormone, and the presence of renal disease. The solutes that most influence a specimen's specific gravity are urea and electrolytes. The glycosuria associated with diabetes mellitus increases both the amount of solute to be excreted and the volume of urine. In severe tubular disease, the kidney may lose its ability to concentrate the urine. Perhaps for specific gravity, more than for any analyte measured in urine, the clinical context must be considered to interpret the result correctly, since the specific gravity provides an indication of the degree of dilution or concentration of the specimen. The presence of X-ray contrast media or urine preservatives may cause a nonphysiologically high specific gravity.

The *clarity* of urine may be important. Normal urine is clear. Turbid urine may be due to the presence of cells, microorganisms or chemical components (eg, uric acid, carbonate or phosphate) precipitating out of solution.

The alkalinity of urine associated with severe urinary tract infections may produce marked turbidity.

The **odor of a specimen** should be noted. Certain diseases are associated with characteristic odors. Ketonuria produces a recognizable smell, heavily infected specimens are associated with an ammoniacal smell, and the urine of patients with advanced liver disease may have a pungent aromatic smell. These smells may lead the experienced physician to a rapid diagnosis.

Chemical Components

Measurement of **protein** is considered a part of all routine urinalyses. All urine specimens contain some protein, but the sensitivity of dipsticks is adjusted so that only abnormal amounts are detected. In the kidney, plasma is filtered at the glomerulus so the glomerular filtrate resembles a dilute plasma, but albumin and proteins of low molecular weight are largely reabsorbed in the renal tubules so that albumin comprises only about one third of the total protein excreted. Not all proteinuria is associated with renal disease. Transient proteinuria may occur following strenuous exercise, with fever or stress, or may even be linked to posture. More persistent proteinuria may still occur in the absence of renal disease, for example with cardiac failure, thyroid disorders, and blood disorders--especially anemia.

Marked and persistent proteinuria is usually associated with renal disease. The major protein excreted is albumin. The heaviest proteinuria, over 4 grams per day (g/d), is seen most often with the nephrotic syndrome, acute and chronic glomerulonephritis, or preeclampsia. Proteinuria ranging from 0.5 to 4.0 g/d may occur with renal infections, diabetes mellitus, multiple myeloma or toxic damage (eg, after the administration of certain drugs). Proteinuria of less than 0.5 g/d may be an early manifestation of severe renal disease but is often associated with tubular damage. Certain diseases are characterized by the excretion of specific proteins; for example, Bence Jones protein is excreted with multiple myeloma. Infections of the lower urinary tract may be associated with proteinuria but are usually mild, and frequently the patient's history enables easy differentiation from the proteinuria of systemic or renal diseases.

The detection of **glucose** in the urine is perhaps the most widely used screening test for diabetes mellitus, and most cases of glycosuria are associated with this disease. Nevertheless, glycosuria may also occur with renal glycosuria, pregnancy, in disorders of the renal tubules (eg, Fanconi's syndrome or Wilson's disease), and in the nephrotic syndrome with damage to the renal tubules. Overflow glycosuria may occur in endocrine diseases, which cause the blood glucose concentration to exceed the renal threshold, and in pancreatic disorders. Severe stress and infections may also cause glycosuria, but in all patients with unexpected glycosuria, diabetes mellitus should be ruled out.

Both **bilirubin** and **urobilinogen** may be detected in urine. Partial or complete biliary obstruction may cause bilirubinuria, as may hepatocellular damage associated with hepatitis or cirrhosis. The excreted bilirubin is conjugated, and its concentration rises in plasma with increased intracanalicular pressure, or from obstruction of the ducts outside the liver. Unlike urobilinogen, the excretion of bilirubin is not increased in hemolytic states. Urinary urobilinogen may be increased in hepatocellular diseases, but is unaffected by partial biliary obstruction and may be decreased with complete obstruction. The increased destruction of erythrocytes with hemolysis causes increased conjugation of bilirubin with glucuronic acid in the liver. The conjugated bilirubin is excreted into the bile where it is metabolized to stercobilinogen and urobilinogen. Some of the urobilinogen reabsorbed from the gastrointestinal tract is subsequently excreted in the urine. Thus a combination of measurements of urinary bilirubin and urobilinogen allows some differentiation as to whether jaundice is due to an obstructive, hepatocellular or hemolytic origin.

Blood may occur in urine as **intact erythrocytes** (hematuria) or as **hemoglobin** (hemoglobinuria). Hematuria may result from renal damage--most often infections or malignant disease--or from disease of other parts of the urinary tract. Trauma, infarctions of the kidney or vascular abnormalities are also common causes. Hematuria may be associated with some systemic disorders that involve the kidneys, and the toxic effects of certain drugs. It is also an early manifestation of overdose of anticoagulants. Hemoglobinuria arises from disruption of erythrocytes in urine or from intravascular hemolysis. Prerenal increases of hemoglobin may result from burn or crush injuries, transfusion reactions, malaria and certain other infections, various chemical agents or drugs, or from congenital or acquired hemolytic anemias. Dipstick tests for hemoglobin detect both free hemoglobin and myoglobin and, to a lesser extent, the hemoglobin in intact red cells. The destruction of erythrocytes in urine is accelerated in dilute urine and under alkaline conditions, so the specific gravity of the urine and its pH should be taken into account in the interpretation of test results. But in the absence of a microscopic examination, a test for hemoglobin in urine cannot differentiate whether only hematuria or hemoglobinuria, or a combination of both, is present.

The pH of urine varies with the acid/base status of a patient. The kidneys share with the lungs the primary responsibility for acid/base homeostasis. The renal tubules are involved in the reabsorption of bicarbonate and the excretion of nonvolatile organic acids and ammonium ions, but urinary pH rarely falls outside the range of 4.7 to 7.8. Measurement of urine pH provides a guide to the overall acid/base state of a patient, but it is also a useful adjunct for the proper interpretation of hematuria and hemoglobinuria.

The **nitrite** and **leukocyte esterase** tests provide an indication of the presence of infections. The nitrite test relies on the reduction of nitrite to nitrate by gram-negative bacteria in the urinary bladder. Relatively insensitive compared with microscopic examination and microbiological culture, the nitrite test is best performed on a first morning specimen since the overnight incubation of the urine in the bladder allows enough time for the nitrite to be reduced to nitrate. The leukocyte esterase test detects the presence of both intact and lysed leukocytes, and has a sensitivity comparable to a microscopic examination.

The detection of **ketones** is a useful adjunct to the measurement of glucose. Ketones are the products of incomplete metabolism of fat. In poorly controlled diabetics, in particular, the excretion of ketones may be increased considerably. Several other conditions may also lead to ketonuria, for example, starvation, prolonged fasting, eclampsia, severe weight loss and high fevers.

Microscopic Examination

The well-performed microscopic examination enables the detection of cells: typically erythrocytes, leukocytes and epithelial cells, casts of all types, crystals and some microorganisms. For meaningful

microscopic examinations the procedure must be standardized. NCCLS has documented an appropriate procedure for the microscopic examination of urine.^{1,3}

Erythrocytes in urine are usually spherical but are prone to rupture in alkaline or dilute urine, and crenate in concentrated urine. When red cells are aggregated in casts and associated with proteinuria, the underlying basis for their presence is renal disease. Eosinophils in the urine usually indicate an allergic interstitial nephritis. More than 30 leukocytes--typically segmented neutrophils--per high-power microscopic field suggest a urinary tract infection, although the number alone does not assist localization of the underlying problem. Leukocyte casts pinpoint the problem as being within the kidney. Epithelial cells provide the best guide to the localization of a problem. Tubular epithelial cells are the smallest and are present in most specimens. Transitional epithelial cells arise from the renal pelvis, ureters or bladder. Large squamous epithelial cells may originate from the ureters. Malignant epithelial cells may originate from any site in the urinary tract from kidney to urethra.

Casts are aggregations of cells. Their width provides an indication of their site of origin. Those with the smallest diameter are formed in the distal convoluted tubules or in the narrowest part of the collecting ducts. So-called broad casts are formed in the collecting ducts or in Bellini's duct. With time the exact cellular nature of casts becomes less distinct. Fresh erythrocyte casts show the presence of red cells, but with time only the ghosts of the red cells remain and eventually become hemoglobin casts. Erythrocyte casts always indicate renal parenchymal disease and are most often associated with glomerular disorders. Leukocyte casts always have a renal origin and strongly suggest an infection such as acute or chronic pyelonephritis, acute glomerulonephritis or interstitial nephritis.

Epithelial casts have the same pathological significance as individual epithelial cells. If of renal origin, they usually imply renal tubular damage; if of transitional cells, they suggest an inflammatory process elsewhere in the urinary tract. Granular casts are largely composed of protein and may arise from degeneration of epithelial cellular casts. Waxy casts are the end-stage degradation products of cellular casts and suggest longstanding and severe renal disease. Hyaline casts are formed from Tamm-Horsfall mucoprotein but may incorporate any of the cells excreted into the urine. Fatty casts--granular casts containing much lipid--are often found in the nephrotic syndrome.

Lipids may also be present in urine as free fat droplets or as oval fat bodies, and occur with fractures of long bones. Urine may contain crystals that are visible with light microscopy. Many of these are the result of drug administration, and the characteristic shape of the crystals may be used to identify the compound present. On occasion, bacteria, fungi (most often *Trichomonas vaginalis*), yeast (often associated with vaginitis) and other organisms may be detected in urine, but before attaching significance to these, one should be certain that the urine specimen was properly collected.

Urinalysis Today

In today's cost-focused environment, when should urinalysis--and what type--be performed? For the periodic physical examination, dipstick testing should be routinely performed to pick up asymptomatic diseases. Microscopic examinations should be performed if there is a history suggesting renal disease or if any of the dipstick tests are abnormal. For the patient admitted to the hospital, a dipstick urinalysis can be readily justified since it is inexpensive and may detect unsuspected asymptomatic disease, the finding of which may spare the hospital and medical staff considerable embarrassment. When there is any suggestion of renal disease, a thorough microscopic examination is always indicated to help localize the site of the problem and to facilitate the diagnosis of the disorder.

References:

1. *Routine Urinalysis and Collection, Transportation, and Preservation of Urine Specimens; Tentative Guideline*. Villanova, Pa: National Committee for Clinical Laboratory Standards; December 1992. NCCLS Document GP16-T.
2. *Urinalysis--The Inside Story: Collection* [videotape]. Villanova, Pa: National Committee for Clinical Laboratory Standards. Order code GP16-T-V1.
3. *Urinalysis--The Inside Story: Evaluation* [videotape]. Villanova, Pa: National Committee for Clinical Laboratory Standards.

Order code GP16-T-V2.

Editorial Commentary



This issue of **LAB NOTES** contains several timely articles. Dr. Donald Young, Director of the William Pepper Laboratory at the Hospital of the University of Pennsylvania in Philadelphia, has written an excellent review on the importance of urinalysis. In it, he emphasizes that, as in the past, urinalysis is still a very viable adjunct to the workup of a patient's problem. In another article, Dr. Mary Burritt of the Mayo Clinic in Rochester, Minnesota, and President of the American Association for Clinical Chemistry, discusses AACC and her plans while President of this important organization.

And thanks to you, our many readers, who completed the safety surveys that were included in **LAB NOTES** Volume 5, Number 3. With your responses, we are able to report on your awareness of, and attitudes about, safety issues.

Jean M. Slockbower, PhD

Editor

In Control

Special Section: Practical Information Concerning Efforts to Understand and Control Infectious Disease

The Results Are In!!!

To determine awareness of and attitudes about safety issues, the Vacutainer Safety InstituteSM commissioned a series of surveys among healthcare workers in the following three areas of expertise: laboratory managers and personnel, nurses, and healthcare executives and administrators. Surveys for laboratory managers and personnel were included in *LAB NOTES* Volume 5, Number 3 (Winter 94/95). The research was conducted by an independent firm, and the results of the first 500 returned surveys are reported here.

Respondent profile

Title/Position/Job function

Respondents were most often lab managers (21%), administrative directors (11%) or phlebotomy supervisors/managers (10%). Each of the following titles was listed by 8% of respondents: lab supervisor, hematology supervisor/manager, and supervisor/manager (unspecified). Six percent were chemistry supervisors. Less than 5% of many other titles were reported, including safety officer, infection control supervisor, and microbiology manager.

Work setting/Length of employment

The hospital was the workplace of 83%. Of these, 21% were employed at hospitals with fewer than 100 beds; 63% worked in hospitals with more than 200 beds. Ninety-five percent had been in their current position for more than 2 years.

Many of the 17% in a nonhospital setting worked at institutions with over 100 employees (43%). A similar share (45%) reported working in institutions with no more than 50 employees. Ninety percent had been in their current position for more than 2 years.

Blood draw

Blood was personally drawn by respondents in the following settings. Hospital: stats (52%), routine rounds (50%), ER (46%), ICU (43%), pediatrics (39%), CCU (38%). Nonhospital: stats (34%), routine rounds (29%), pediatrics (22%). Results indicate that those not reporting--42% of hospital workers and 57% of nonhospital workers--do not personally draw blood.

Presence and participation in patient care teams

Patient care teams are more prevalent in the hospital setting, with 55% of respondents citing their existence. In hospitals with teams, 29% of respondents reported being a team member. Nonhospital settings are less likely to have team patient care; only 28% do according to respondents. However, 39% of respondents at nonhospital institutions with teams reported being a team member.

Attitudes about safety issues

The majority of respondents feel they have a good understanding of government safety guidelines and the risks associated with biohazard exposures.

Knowledge of guidelines

Knowledge of federal and state safety guidelines was rated by respondents on a scale of 1 (don't know) to 5 (totally understand). Respectively, 75% and 72% of hospital and nonhospital respondents rated their understanding as a 4 or above.

Understanding of and concerns about risk

Respondents were asked to rate their understanding of the risks associated with biohazard exposures incurred during specimen collection, on a scale of 1 (don't understand) to 5 (understand completely). Respectively, 79% and 82% of hospital and nonhospital workers indicated that they (5) "understand completely" the risks.

Employees in both settings share a high level of concern about biohazard exposure during specimen collection and processing. On a scale of 1 (not concerned) to 5 (very concerned), the average concern rating for hospital workers was 4.3, with 56% reporting they were very concerned. For nonhospital workers the average concern rating was 4, with 45% reporting that they were very concerned.

Needlesticks

Eighty percent of hospital workers and 92% of nonhospital workers responded that the frequency of needlesticks was accurately reported in their institution. Nineteen percent and 6%, respectively, felt that needlesticks were underreported.

Safety training

Most of the respondents' employers provide some form of safety training. The source and type of continuing education offered, as well as areas in which respondents feel a need for additional training, are summarized below.

Sources of safety training and education

The clear majority of respondents--94% of hospital workers and 90% of nonhospital workers--believe they receive adequate safety training from their institutions to do their jobs effectively and safely. In fact, safety is often the topic of continuing education courses: more than 50% of both groups gave a rating of 4 or above on a scale of 1 (safety is never the topic) to 5 (safety is always the topic).

Employer support of safety training

Hospital and nonhospital employers support safety training in a variety of ways. Respectively, they provide space for courses on site (65%, 65%), pay for courses (61%, 70%), give time off (59%, 66%), and support training in other ways (37%, 33%). Only 3% to 4% of institutions do not support safety education. Other significant sources of safety education cited by hospital and nonhospital employees, respectively, are manufacturers (71%, 72%), journals (70%, 77%), associations (47%, 55%), schools (13%, 10%), and other (19%, 18%).

Although most of the respondents described themselves as being adequately trained, many feel the need for further training in specific areas. For example, 40% of hospital workers and 37% of nonhospital workers cited a need for more training or information on how to comply with OSHA guidelines. Approximately one-third of respondents in each group cited the need for more training in both safe specimen collection/handling and safe waste disposal.

New safety products

Attitudes toward safety products may give an indication of how much and how effectively they are used. Several survey questions assessed opinions about the efficacy and use of new safety products.

Training for new products

The majority of respondents regard their training in how to use new products and techniques as adequate. However, 14% of hospital employees and 20% of nonhospital employees answered that they did not receive enough training on the use of new products.

Perceived safety and ease of use

When asked if they feel most new products for specimen collection offer greater safety, 84% of hospital respondents and 80% of nonhospital respondents answered affirmatively. Respectively, more than 1 in 5 (22%, 27%) feel that these new products are also easier to use than are traditional products. About half (46%, 51%) believe new products have the same ease of use as traditional products. Twenty-four percent and 17% feel they are more difficult to use.

Staffing issues

Staff levels, turnover and assignment of phlebotomy duties may significantly impact safety. Attitudes of personnel toward staffing and the trend toward the use of nonphlebotomy personnel for specimen collection and its effect on safety are summarized below.

Shift in phlebotomy personnel

The use of nonphlebotomy personnel to collect and transport specimens is prevalent in hospitals, according to 58% of respondents in this setting. Of those who see this trend, 42% believe it results in more needlestick injuries, and 27% see more tube breakage as a result.

Conversely, only 27% of nonhospital respondents reported a shift toward nonphlebotomy personnel. Of these, about one quarter believe it contributes to more needlesticks (27%) and more tube breakage (23%).

Adequacy of staffing, and employee turnover

The majority of respondents in both hospital and nonhospital work settings (76%, 84%) feel their departments are adequately staffed. Also, reported employee turnover rates were relatively low. On a scale of 1 (very low) to 5 (very high), the average cited among hospital employees was 2.2, and among nonhospital workers the average was 1.8.

Conclusion

Results of this research indicate that laboratory professionals are knowledgeable about the risks inherent in their profession, and the safety guidelines, products and techniques designed to reduce these risks. Although respondents reported receiving adequate safety training from their institutions, the professionals expressed considerable concern about the risk of biohazard exposure.

Interview with Mary F. Burritt

LAB NOTES recently had the pleasure of interviewing Mary F. Burritt, PhD, Director of General Chemistry Laboratory, and Consultant in the Hospital Clinical Laboratories at the Mayo Clinic in Rochester, Minnesota. In January 1996, Dr. Burritt assumed the role of president of the American Association for Clinical Chemistry (AACC). We asked Dr. Burritt to tell us about the AACC, and her goals during her presidency.

LAB NOTES: Dr. Burritt, please tell us a little about the character and importance of the AACC.

Mary Burritt: The AACC is a nonprofit national organization for chemists, physicians and other scientists who specialize in clinical chemistry and clinical laboratory sciences. Founded in 1948, and incorporated under the laws of the state of New York in 1949, the AACC currently has nearly 11,000 members who work in the laboratory field--primarily in hospitals, reference laboratories and industry.

In 1992, the association established a Strategic Planning Task Force to critically assess where the association has been, develop a vision statement, and project where the association should and will be in the future. The task force agreed upon a new vision statement for AACC, which is: *To provide national and worldwide leadership in advancing the practice and profession of clinical laboratory science and its application to health care.* With this vision statement, we established a new and expanded focus for AACC.

First, we wanted to recognize that we are a **worldwide organization**: About 20% of our membership comes from outside the United States and is the fastest growing portion of our membership.

The vision statement also addresses the fact that the **profession is changing** and that we must be adaptable. The boundaries between chemistry, hematology and microbiology are blurring, and it is likely that clinical chemists may be more involved in those other fields in the future.

We also identified **several strategic issues**: our international role; the publications of the association--both *Clinical Chemistry* (our journal) and *Clinical Laboratory News*; the meetings, which are our primary source of education for our membership; and, finally, our organizational relationships with other professional societies. We realize that in the future, cooperative efforts with other national and international societies will be of increased importance. Therefore, we have a number of joint efforts ongoing with other professional associations.

Besides the national association, doesn't AACC have regional or state groups?

AACC currently has **22 local sections** throughout the United States. Some of them are fairly small geographically, where there is a high population of members--these include the larger urban areas such as those on the East Coast. As you move to the west, the sections get much larger geographically. For example, the Midwest Section encompasses North and South Dakota, Minnesota, Iowa, Missouri, Kansas and Nebraska. And to the west, the Rocky Mountain Section goes all the way from the Canadian to the Mexican border.

Each of the local sections has its own programming and meetings, although joint and regional meetings are common. The chairs of these local sections participate in leadership workshops every few years on the national level, to keep them informed of the activities of the association. Each local section also elects a representative to the House of Delegates, which meets twice a year. We consider these activities to be very important, as many of the future leaders of the association will come from the local sections' officers and House of Delegates.

Each Canadian and Mexican member is assigned to a local US section that is close geographically to where they live, which allows them to participate in local section activities. Some of these members have also been involved at the national level.

Would you share some of your thoughts on what you would like to accomplish during your presidency?

I have a number of areas that I want to highlight in 1996. One of my goals is to **increase communication**, both with our domestic and our international members. The first mechanism to achieve this is to form a new category of member involvement in committees, which we are calling "Corresponding Committee Consultants." These consultants will be appointed to various AACC committees, and this category is open to all international and national members. They will participate in conference calls and receive all correspondence, but their travel to meetings will not be financed. This category is similar to the Observers and Advisors on the NCCLS [National Committee for Clinical Laboratory Standards] committees, and the Associate Members on the IFCC [International Federation of Clinical Chemistry] committees. It gives us an excellent opportunity to get more members involved in committees, is a good way for our international members to be involved when they can't travel to the meetings, and is an important mechanism for our new young members to learn the committee and governance structures of the association. As I said, we consider it a great opportunity to allow more association members to have input, and demonstrate their interest and willingness to serve.

Second, the AACC Office and the Board are actively working on **Internet access** for AACC, and we should have a home page available quite soon. Once the home page is operational, we will concentrate on the types of information we want available on the Internet. For example, it would be very useful to have sections that contain association news, meeting information, articles of general interest regarding healthcare reform, product information and division activities. This is an excellent mechanism to increase communication worldwide to both members and nonmembers. We also have an association newsletter, *AACC News*, which is sent to all members and is another vehicle for increased communication.

Another goal for 1996 is to **increase our international efforts**. It is important to recognize the international role of AACC, and the needed and welcomed participation of our international members. There is a tremendous potential for AACC to partner with the IFCC and other associations worldwide.

Tell us more about the IFCC.

The International Federation of Clinical Chemistry is made up of about 70 member countries. AACC is a member, and I am the association representative to the IFCC. There are three regions under the umbrella of IFCC: the Asia-Pacific Region; COLABIOCLI, which comprises Mexico, Central America, South America, Spain and Italy; and the European Federation. There are many opportunities for AACC to be involved with the different country societies or with the regions in joint sponsorship of meetings. Several years ago, we formed an International Advisory Committee to our Membership Committee. The Advisory Committee meets annually during the AACC Meeting and corresponds throughout the year. The committee members provide important input, make recommendations and provide valuable contacts with the international scientific community. I would like to increase the interaction and involvement of those individuals.

Do you have other goals for 1996?

When Lawrence Killingsworth was president of AACC in 1993, he started a policy of "govern more, manage less." Under this policy, the Board concentrates on governance, and sets policy to a level with which it is comfortable. Then it delegates to the committees, and allows the committees and commissions to complete their charges without micromanagement from the Board. We have strived to keep **governance at the policy level** and this effort has been very successful. I am committed to the continuation of this program.

In 1996, we will develop both **international and financial policies**. We have individual documents and motions that have been passed regarding our international and financial activities, but we have no umbrella policy. This overall policy allows us to quantify our values and collective wisdom, and defines and sets the direction of the association regarding these issues.

Finally, one of the most important things that AACC did in 1995 was the formation of a Task Force on the Changing Practice Environment. Its charge was to review the current rapidly changing healthcare environment, particularly regarding managed care; review the response of the AACC, the challenges, threats and opportunities; and to formulate plans as to how AACC can help its members survive and thrive in the new environment.

The Task Force produced an excellent report. It's a 55-page document that was approved by the Board of Directors in September. It contains an overview of the field, the macroeconomic forces and the external influences on laboratories and the healthcare industry. We reviewed the opportunities for AACC, the challenges, and how AACC is positioned. We then formulated what we consider to be core competencies for clinical chemists in the future. These included the areas of clinical consultation [appropriate use of clinical tests/test logic]; technical aspects, concentrating on robotics/automation/informatics; and management aspects, concentrating on strategic leadership skills and multidisciplinary teams.

And you want to get this message out to your membership.

Definitely. We will concentrate our new **educational efforts** over the next several years in these three key areas, in order to offer our members the programming and the information they are going to need to compete in the new environment. This is our number one priority for 1996.

Also in 1996, a new task force called the Delta Group will be responsible for generating concrete programmatic and educational activities based on this report. We will begin to put teaching and education modules together on each one of the above-mentioned topics and present these to our members in a variety of formats. This activity will continue over a several year period, as we begin to build these necessary skills that will be vital as we move into the 21st century and the full implementation of managed care or its successor. One of the most important things I will do is to facilitate implementation of these recommendations and then, wherever possible, to reflect these recommendations in the committee charges for next year. It is very important to begin to offer our members the tools they need to compete in this new environment as soon as possible.

To summarize, my goals for 1996 are to increase communication and international efforts, continue policy governance, increase interaction and participation with other professional societies, and implement recommendations of the Task Force on the Changing Practice Environment and the Delta Group.

Becton Dickinson VACUTAINER® Systems New Products News

VACUTAINER Brand LOK-ON™ Needle Disposal System

The VACUTAINER Brand LOK-ON™ System is an integrated system for convenient needle disposal. It consists of a reusable needle holder and a needle disposal container, and is a good choice for outpatient blood collection. The system is easy to use--with a simple click, the holder locks onto the needle removal port, and after a 1/2 turn, the used needle is easily removed from the holder and deposited in the LOK-ON™ Disposal Container. The translucent fill line and side panels make it easy to see when the container is full.

The VACUTAINER Brand LOK-ON™ Needle Holder is durable and can hold up to 300 needles, minimizing the cost per phlebotomy procedure. There are only two components to the LOK-ON™ System, so there are no expensive accessories to inventory and transport.

The system complies with OSHA regulations: The disposal container is impact resistant, puncture resistant, leak resistant, and has temporary and permanent locking lids for use during transportation.