

Inova Health System is a not-for-profit health care system in Northern Virginia that consists of hospitals and other health services including home care, nursing homes, mental health services, physician practices, wellness classes, and freestanding emergency and urgent care centers. Governed by a voluntary board of community members, Inova's mission is to provide quality care and to improve the health of the diverse communities we serve.

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## Younossi Joins Inova's Center for Liver Diseases

Zobair M. Younossi, MD, MPH, a staff physician with the Department of Gastroenterology and the Liver Transplant Center, The Cleveland Clinic Foundation, has been named the director of the newly established Center for Liver Diseases at Inova Fairfax Hospital.

Dr. Younossi has been a staff physician with the Cleveland Clinic since 1995. He also has served as a senior researcher with the I.H. Page Center for Outcomes Research of the Cleveland Clinic Foundation and has held appointments at both the Department of Medicine of Metrohealth Medical Center, Case Western Reserve University and Penn State University.

Dr. Younossi received his bachelor's degree from George Mason University and graduated Alpha Omega Alpha from the University of Rochester School of Medicine and Dentistry, Rochester, NY. He completed his residency at the Scripps Clinic and Research Foundation, La Jolla, CA, where he also received fellowship training in gastroenterology and hepatology. During his fellowship, he obtained a master's degree in public health from San Diego State University's School of Public Health and was awarded both the Hanlon Award and the Outstanding Student Award.

Dr. Younossi has been a member of the Board of Directors of the American Liver Foundation Northern Ohio Chapter, the Education Committee of the American Association for the Study of Liver Disease and was the recipient of the Career Development Award of the American College of Gastroenterology. He is a fellow of the American College of Physicians and the American College of Gastroenterology. He is board certified in internal medicine and gastroenterology and is an UNOS-certified transplant hepatologist.

His research interests include non-alcoholic steatohepatitis (NASH) and the efficacy trials of hepatitis C. He also has pioneered health services research and outcomes research in liver diseases, mainly relating to health-related quality of life and its application to chronic liver diseases and liver transplantation. He has authored more than 100 publications, including articles, book chapters and abstracts, and has been an invited speaker to numerous local, national and international meetings.

Dr. Younossi can be reached at **703-698-2279**.

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# Liver Update

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## Tumor Ablation Clinic Offers Advanced Treatment

A multidisciplinary Tumor Ablation Clinic has been established at Inova Fairfax Hospital. The clinic is staffed by a team of surgeons, interventional radiologists and medical oncologists. The goal of the clinic is to offer advanced treatment options to patients with primary or metastatic hepatic malignancies.

An increasing number of effective treatments are available today for patients with hepatic malignancies. There have been significant advances in minimally invasive percutaneous therapies, as well as in hepatic resection and transplantation. The widened array of treatment options has added a higher level of complexity to this field, with some of the therapies “compartmentalized” within one subspecialty field. Surgeons, interventional radiologists, and medical oncologists are combining their expertise in the clinic to offer all treatment options to their patients. The clinic is also designed to allow physicians to offer effective combination treatments and to develop seamless treatment algorithms in conjunction with referring doctors.

The liver is a significant site of malignancy, both primary and metastatic. The incidence of **hepatocellular carcinoma (HCC)** is on the rise in the United States, with a 50 percent increased incidence and 41 percent increase in mortality since the 1980s. Many of the new cases are related to a dramatic rise in Hepatitis C, with almost four million individuals infected. HCC is chemo- and radiation therapy resistant, and the definitive therapy has been surgical resection and/or hepatic transplantation. Minimally invasive therapies have played an increasingly important role in the treatment of HCC, both as stand-alone palliative therapies and when used in combination with surgery.

Metastatic **colorectal carcinoma (CA)** is another significant cause of hepatic malignancy. About 140,000 cases of colorectal carcinoma are diagnosed in the United States each year, and approximately half of these patients will eventually develop liver metastases. Aggressive treatment strategies are warranted, as in up to one-third of cases the liver will be the sole source of extracolonic disease following primary resection. About 10 to 20 percent of patients with hepatic metastases are candidates for curative resection, with 30 – 40 percent five-year survival rates achievable. Interestingly, of those patients who recur in the liver following an initial resection, the five-year survival rates for a second surgery are also in the 30 percent range, of those patients who are candidates for repeat resection. Minimally invasive local and regional treatments have been used in combination with surgery and with systemic chemotherapy in an effort to prolong survival and to convert ever-increasing proportions of patients to candidates for surgical care.

Surgical resection remains the mainstay of curative therapy. While many tumors are curable when discovered early, most patients present with advanced disease. Efforts to improve early detection have been hampered by the lack of consensus on effective surveillance strategies, even among high-risk patients. Even more disconcerting is a lack of awareness of diagnostic and curative options when abnormalities are detected

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## Liver Transplant Program

Timothy Shaver, MD  
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*Abdominal Transplantation*

Rakesh Vinayek, MD  
*Medical Director*  
*Liver Transplant Program*

*Transplant Surgeons*  
Dympna Kelly, MD  
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Gabriel Herman, MD  
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Bonnie Erickson, RN  
Marion Stewart, RN

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- TUMOR ABLATION CLINIC
- NEW TRANSPLANT CENTER DIRECTOR
- REFERRING A PATIENT TO THE LIVER TRANSPLANT PROGRAM

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and malignancy confirmed within the liver. The advantages of high resolution of MRI, CT, ultrasound, and nuclear medicine studies have been overlooked, as has the ease and accuracy of percutaneous biopsy techniques. With these tools, there is no reason to temporize in patients with known malignancies who develop new abnormalities. An early, aggressive approach may mean the difference between palliation and cure.

A number of new minimally invasive therapies are available, and there have been significant refinements to existing treatments. These tools are now frequently used in combination with other minimally invasive procedures or with surgery. Radiofrequency ablation (RF), chemoembolization, and percutaneous ethanol injection (PEI) are used most frequently among patients referred to the Tumor Ablation Clinic. In addition, there are a number of promising therapies in clinical trials now that offer novel methods of targeted delivery of cytotoxic drugs, radiopharmaceuticals, or energy.

**Chemoembolization (CE)** is a catheter-directed regional therapy. CE is used most commonly in patients with hepatocellular carcinoma, either as palliation or as a bridge to hepatic transplantation, but excellent responses have also been achieved with neuroendocrine tumors, sarcomas, and intrahepatic cholangiocarcinomas. The role of chemoembolization in the treatment of metastatic colorectal carcinoma is uncertain, and a randomized controlled clinical trial will soon be underway to answer this question.

Among patients with HCC, chemoembolization alone carries three-year survival rates of 25 to 30 percent. This compares favorably to median survival of one to four months in patients who receive only supportive care. When combined with local ablative techniques such as radiofrequency ablation or alcohol injection for large tumors, three-year survival rates approach 65 to 75 percent. Chemoembolization is safe, with 30-day morbidity and mortality

rates of approximately five and one percent, respectively.

**Radiofrequency ablation (RFA)** has become clinically available for local control of hepatic malignancies over the last two years. RFA probes are specifically adapted needle electrodes that allow the precise deposition of energy into tumor nodules under imaging guidance. RF energy is converted into heat, which is confined in a precise geometric pattern. In this way rounded “balls” of thermal necrosis can be created. RF is an excellent palliative technique, is generally performed on an outpatient basis, and is applicable in patients with up to five tumor nodules each no greater than five cm in diameter. Larger lesions can occasionally be treated with good results.

The procedure is performed under IV sedation, and patients can expect mild right upper quadrant soreness for one or two days post-procedure. In a recent study by investigators for the MD Anderson Cancer Center and the Pascale Institute in Naples, Italy, of 169 tumors treated, there was a 1.8 percent recurrence rate at mean followup of 15 months, with a complication rate of 2.4 percent.

**Percutaneous Ethanol Injection (PEI)** is another local treatment for hepatic malignancies. Alcohol injection is useful in control of nodular hepatomas. An alcohol dose is calculated to match the tumor volume; the injected liquid causes protein denaturation and cellular dehydration. Alcohol is useful in cases in which RF cannot be used. PEI is generally performed on an

outpatient basis under local and intravenous sedation. Alcohol is used alone in small nodular HCC's, or may be used in combination with chemoembolization. Alcohol has been used as well to amplify the thermal effects of RF.

A number of new therapies are now being tested. Microwave and laser ablation probes may offer ways to create thermal lesions in patients with large masses. High intensity focused ultrasound (HIFU) is a method of thermal necrosis that is completely external, avoiding the need for percutaneously placed probes or catheters. Magnetic transfer carriers (MTC's) are magnetized particles containing cytotoxic drugs. These particles are injected into the bloodstream, then “steered” into the tumor bed by an externally positioned magnet.

All of these techniques are evolving quickly. Our hope is that through the Tumor Ablation Clinic, patients can benefit from advanced therapies. In this way, we hope to double the 10 to 15 percent of patients who are candidates for surgical care, and to provide safe and effective palliation for as many patients as possible. It is important to emphasize however, that prevention is the best care. Annual stool *swiac* tests and digital rectal examination as well as sigmoidoscopy every five years, beginning at age 50, are recommended in all patients.

For more information about the Tumor Ablation Clinic, call **Alain T. Drooz, MD**, at **703-698-3241** or **Dympna Kelly, MD**, at **703-698-2986**. The Tumor Ablation Clinic is open to participation by all staff members of Inova Fairfax Hospital.

#### CANDIDATES FOR CLINIC EVALUATION

- primary or metastatic disease to the liver
- liver-dominant disease
- adequate hepatic, cardiac, and renal functions
- able to undergo a percutaneous procedure

#### CANDIDATES FOR RADIOFREQUENCY ABLATION

- no more than five tumor nodules, each no greater than 5 cm in diameter
- or
- single dominant nodule up to 12 cm in diameter
  - no more than minimal ascites
  - no uncorrectable coagulopathy
  - no implanted electronic devices

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## Humphreys is New Director of Transplant Center

Susan Humphreys is the new director of the Inova Transplant Center at Inova Fairfax Hospital. Humphreys holds bachelor's and master's degrees in nursing from Boston University and is enrolled in the MBA program at Johns Hopkins University.

Until 1987, Humphreys worked in adult critical care. She entered the transplant program at Massachusetts General Hospital and spent 10 years managing the transplant unit, PICU and NICU.

Most recently, she spent 18 months as the organ procurement clinical coordinator and educator at Massachusetts General Hospital and the New England Organ Bank. In 1997, she was appointed clinical manager of the Adult Solid Organ Transplant program.

Humphreys said she is happy to be at Inova Fairfax Hospital.

"I'm looking forward to working with teams in a non-academic setting that already have an excellent program, and are patient-centered in their approach," she said. "I was very attracted to the organization overall - its product line structure and the fact that it is a magnet hospital for nursing. The attention to nursing excellence and professional development/satisfaction seen here is hard to find."

Humphreys continues to work with a Health Resources and Services Administration organ donation grant with the Transplant Resource Center of Maryland and Johns Hopkins Hospital. She is a member of the National Association of Transplant Coordinators and is certified as a procurement coordinator and clinical coordinator.

She has three children and two grandchildren.

## Referring a Patient to the Liver Transplant Program

Liver transplantation, a procedure first performed in the 1960s, is now a standard procedure for selected patients who no longer respond to other treatments. It is the last hope for many patients facing end stage liver disease as a result of maladies such as hepatitis, alcoholism, and hereditary and metabolic liver disorders. With a liver transplant, these individuals have an opportunity for a renewed life.

At Inova Fairfax Transplant Center, we believe that transplantation is a lifelong commitment from evaluation through surgery and recovery. The center's philosophy emphasizes patient and family education and support throughout the entire process. By including patients and their families in the health care process, we are able to integrate quality, continuity and expertise in the delivery of care. Our team members are knowledgeable about the needs of the liver transplant patients and their loved ones. Through a multidisciplinary team approach, we provide state-of-the-art care to each patient before and after transplantation.

There are several mechanisms available for referring the patient to the transplant program. You can contact the Transplant Center and ask for pre-liver transplant coordinator, who is available to answer any questions you may have about the program and evaluation process. She can also refer your patient to one of the team hepatologists for further evaluation.

After hours, you may call **703-698-3158** and ask for the liver transplant coordinator on call. She will return your call and arrange for one of the hepatologists to contact you. You can also contact the Transplant Center directly and ask for either Rakesh Vinayek, MD, the medical director of the program, or one of the transplant surgeons, to discuss transplant or other treatment options available for your patients.

Once the initial contact has been made with the Transplant Center, the patient is called for an appointment with the transplant coordinator who guides the patient through an extensive medical and psychosocial evaluation. Our testing and diagnostic procedures, such as laboratory and radiological studies, and medical consultations, allow the transplant team to thoroughly evaluate each potential transplant candidate. You will be contacted via letter by the Center within two to three weeks regarding the evaluation of your patient and an estimated date of completion for the evaluation process.

After obtaining all tests and diagnostic results, the team discusses transplantation or other alternative therapies with the patient. Patients accepted for transplantation are registered with the national computerized listing that matches recipients with available organs.

If you have any questions about your patient evaluation or listing status, call the Transplant Center at **703-698-2986** or **1-800-358-8831**.