

Northwestern Transplant Hepatology Fellowship Handbook 2026-2027

Christopher Moore, MD

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Contact Information

Angela Tucker

Program Coordinator, Transplant Hepatology Fellowship
Program Coordinator, Gastroenterology & Hepatology Fellowship
Division of Gastroenterology & Hepatology
Northwestern University
Feinberg School of Medicine
angela.tucker2@nm.org

Christopher Moore, MD

Assistant Professor of Medicine
Transplant Hepatology
Northwestern University
Feinberg School of Medicine
Program Director, Transplant Hepatology Fellowship
Education Director, Hepatology Services
Site Director, Visiting Hepatology Rotators
cmoore1@nm.org

Sarang Thaker, MD, MS

Assistant Professor of Medicine
Department of Medicine, Division of Gastroenterology & Hepatology
Feinberg School of Medicine
Program Director, M4 Hepatology Elective
Associate Program Director, Transplant Hepatology Fellowship
sarang.thaker@nm.org

Introduction

Northwestern Medicine (NM), through its primary teaching site, Northwestern Memorial Hospital (NMH), offers premier Liver Transplant (LT) and Hepatology programs, both distinctive and yet inexorably linked. While the Hepatology program is administratively contained within the Department of Medicine (DOM), it functions operationally within the Division of Solid Organ Transplant (SOT).

The LT program has numerous assets: (1) demonstrating continued success with both high volume (~ 180 LTs per year; ~ 15% are living donor) and excellent patient outcomes aligned with national norms; (2) numerous faculty thought-leaders; (3) unique partnerships across the country and internationally; and (4) strong collaborations with a number of highly-regarded subspecialties such as Gastroenterology (GI), Interventional Radiology (IR), Oncology and Transplant Infectious Diseases (TID).

In particular, the faculty have diverse interests and attachments to research (clinical, translational, and basic sciences), education (trainees, continuing medical education), national specialty

organizations and industry. The faculty will serve as mentors and role models in all aspects of academic life and professional practice.

We believe in and strongly support a collegial work environment with our colleagues and staff members. In such an environment enhanced patient care, scientific collaboration, mentorship and deep friendships can all flourish.

This is an ACGME-accredited fellowship (1-2 positions/year) after which the fellows are eligible for Transplant Hepatology (TH) Board Certification.

Mission & Aims

To provide excellent patient care, generate substantive research, and train future academic leaders.

- A. Clinical expertise in advanced liver disease (Hepatology, Pre- and Post-LT Hepatology)
- B. Clinical care and education to Chicagoland and the Midwest region – with particular emphasis to under-served populations, exemplified through our African American and Hispanic Transplant Programs, and to our international partners
- C. Generate substantive research in clinical, translational, and basic science through close collaboration with faculty mentors

Fellow Supervision & Evaluation Process

Definition

TH fellow: a 4th year fellow (PGY7+), matriculated through the traditional pathway – after a 3-year GI fellowship; or, a 3rd year fellow (PGY6), matriculated through the integrated pathway – after a 2-year GI fellowship. PGY6 fellows complete the GI fellowship upon completion of the TH fellowship. PGY7+ fellows may be internal or external in origin, whereas the PGY6 fellow is always internal. Both pathways lead to TH board eligibility.

Policies

To ensure both patient safety and full educational opportunities, all TH fellows will be supervised by the transplant faculty while caring for patients at NMH, and during their rotation at Lurie Children's Hospital (LCH).

- A. TH fellows are trainees, under the supervision of the hepatology and transplant surgery faculty in all clinical settings; graduated autonomy is granted based on continued competence
- B. Specific credentialing documentation appropriate for the level of training is maintained
- C. Faculty will monitor and assess trainees for: (1) communication and interviewing skills; (2) accurate and detailed histories; (3) detailed physical examinations; (4) efficient and effective acquisition and interpretation of patient data; (5) procedural safety and competence; (6) appropriate management of patients; (7) effective and efficient communication of patient data to interested parties; (8) responsiveness to faculty and staff

feedback; (9) leadership and education to trainees and peers; and, (10) professionalism in interactions with trainees, staff and faculty

- D. Documentation of trainee supervision during procedures (EGD, colonoscopy) is maintained by TH fellow and the Program Director (PD)/Program Coordinator (PC)
- E. Subspecialty experiences (Pediatric TH and TID) are under the supervision of the particular PD and their allied faculty, as determined by the Residency Review Committee

Work Schedule

The TH fellowship occurs over 1 year, traditionally divided into 12 blocks (1 month = 1 block) for each fellow. The fellows alternate between outpatient services (clinic (4) + external rotations (0.5 x 2) + vacation (1)) and inpatient services (6). Given various needs and pressures upon the services and/or the fellow, it is understood that some blocks may be shorter or longer than the traditional month (in aggregate yielding 50% inpatient). As such, the fellow's efforts will be monitored and re-balanced on a semi-annual basis.

Outpatient and inpatient months provide complex and complimentary exposure to clinical and educational experiences. There is more than sufficient faculty oversight and interaction throughout all of these experiences. As the months progress, and the experience and competency of the fellows increase, as deemed appropriate by both the faculty and the fellow(s), graduated autonomy (always with proximate supervision) will occur (*vide infra*).

Supervised Services

- A. Inpatient (Hepatology primary service and Hepatology consultations)
- B. Outpatient clinics (Hepatology, Pre-LT and Post-LT)
- C. Procedures (EGD and colonoscopy)
- D. Research and/or Quality Improvement (QI) projects involving patients

Inpatient

Fellows have operational control of admissions, management, and discharge of patients (under faculty supervision) whilst directing and educating residents on the Hepatology primary service. In October, fellows can round on the service as the *de facto* attending, with sign-out to faculty (in-person, or by phone). In particular, admissions, unexpected discharges, or meaningful change in clinical status, e.g. to ICU, or death, requires an immediate service faculty update.

Outpatient

Fellows will have a number of clinics, some functioning as continuity clinics, in Hepatology and Pre- and Post-LT. As fellow competency improves, autonomy increases in these domains: (1) evaluation of patients independently with assessment and plan rendered to the supervising faculty; (2) facilitating direct admissions (from clinic) to the Hepatology primary service; (3) management regarding the substantive and sundry results that comprise Post-LT Nursing Rounds (*vide infra*); and (4) endoscopy (*vide infra*).

Procedures

Diagnostic and therapeutic procedures, in the form of EGD and/or colonoscopy are critical parts of the fellowship experience. Procedures occur throughout all rotations. In particular, the following

require specific attending attention: (1) the initiation and termination of all procedures; (2) administration of medications; and (3) therapeutic actions, e.g. variceal banding.

Attendance

The fellowship provides protected time for scheduled conferences and lectures. The majority of conferences are on Fridays, and the audience is a mixture of trainees, faculty and otherwise interested parties.

Evaluation of the fellow

The assessment of fellow competency is rendered through “face-to-face” and electronic communications: (1) daily feedback from the supervising faculty and/or PD; (2) end-of-rotation feedback directly from faculty, and formally documented through New Innovations (NI) evaluations; (3) weekly office-hours with the PD; and, (4) semi-annual Clinical Competence Committee (CCC) reviews (rendered through “face-to-face” and electronic communications). Note, the CCC represents the consensus faculty review of the fellow’s professional current and future state.

There are specific rotation evaluation forms in NI (outpatient is 1-month block with various faculty; inpatient is a 1-month block with one faculty per week). These forms will be sent to the supervising attendings, with 1 week to complete. The PC and PD will monitor content and completion of these forms.

Evaluations of the faculty

There are specific rotation evaluation forms in NI (outpatient is a 1-month block with various attendings; inpatient is a 1-month block with one attending per week). These forms will be sent to the fellow, with 1 week to complete. The PC and PD will monitor content and completion of these forms. To protect fellow anonymity, evaluations are integrated into a larger pool of GI fellow evaluations, and then rendered to faculty in a delayed fashion.

Evaluation of the fellowship

Fellows and faculty evaluate the program throughout the year: (1) 1:1 personal correspondence with the PD; (2) weekly office-hours; (3) semi-annual CCC meetings; and (4) annual Program Evaluation Committee (PEC) meetings. NI evaluations are reviewed at semi-annual CCC meetings. Northwestern GME and ACGME mandate separate comprehensive annual reviews (objective data and interviews).

Faculty & Selected Staff

Hepatology

Justin Boike, MD, MPH; Amanda Cheung, MD; Andres Duarte-Rojo, MD, PhD; Sheila Eswaran, MD; Daniel Ganger, MD; Richard Green, MD; Dempsey Hughes, MD; Sean Koppe, MD; Laura Kulik, MD; Christopher Moore, MD; Saad Saffo, MD; Sarang Thaker, MD, MS

Transplant Surgery

Daniel Borja-Cacho, MD; Juan Carlos Caicedo, MD; Derrick Christopher, MD, MBA; Jesse Davidson IV, MD; Zachary Dietch, MD, MBA; Daniela Ladner, MD, MPH; Joseph Leventhal, MD, PhD; Satish Nadig, MD, PhD (Chief); Vinayak Rohan, MD; Dinee Simpson, MD

Transplant Hepatology Fellowship Coordinator

Angela Tucker

Transplant Social Services

Janet Aminoff, LCSW; Amanda Briskin, LCSW; Norma Haro, LCSW (lead); Colleen Kelley, LCSW; Carla Kozlowski, LCSW; Lydia Loveland, LCSW; Allison Nichols, LCSW; Stephanie Young, LCSW

Transplant Psychiatry/Psychology

John Franklin, MD

Telephone Numbers

Hospital Area Code	312-xxx-xxxx
	extensions 6-xxxx = 926-xxxx 5-xxxx = 695-xxxx 4-xxxx = 694-xxxx 2-xxxx = 472-xxxx
14 East RN station (Feinberg: Hepatology inpatients)	6-2853
14 East Residents Room (Feinberg: Hepatology inpatients)	6-1394
Admissions	6-2074
Endoscopy (Galter: inpatient, or outpatient MAC)	6-6197 (Recovery) 6-6198 (Admitting) 4-0571 (Charge nurse)
Endoscopy (Lavin: outpatient conscious sedation/MAC)	6-2656 (Nurses station) 4-0375 (Charge nurse)
Emergency Department (Feinberg)	6-5188
Hepatology Clinic (Lavin - Workstation)	2-6992
Operator	6-2000
Pre-LT Hepatology RN Office (Arkes 19th floor)	5-5437

Pre/Post LT Clinics (Arkes 19th floor - “Nerve Center”)	5-0476
Post-LT RNs (Arkes 19th floor - “Quiet Room”)	5-6963
Surgical Pathology (Galter 7th floor)	6-3211
Transfer Center (admissions to Hepatology primary service)	6-3321

Fellowship Overview

The fellowship will provide the knowledge and experiences to become an independent and highly qualified TH physician. By the end of the fellowship, fellows will have easily met and surpassed all requirements to take the ACGME TH Board Examination.

Fellows will care for patients manifesting a large variety of illnesses and in varying stages (acute to chronic). This care will be within the framework of a multidisciplinary team: TH, Transplant Surgery, IR, Interventional GI (IGI), TID, Transplant Nephrology, Psychiatry, Nutrition, Physical Therapy, and Social Services. The fellows will commonly collaborate with trainees in these disciplines and others. We strongly believe that this approach (both vertically and horizontally), not only improves patient care, but enhances the quality of our Divisions, Departments and NMH generally.

A main objective of this fellowship is to better understand medical illnesses within a biological and psycho-social context. Daily teaching rounds and several weekly conferences and lectures are integral to fellowship training. Fellows are given the opportunity to participate in institutional and professional organization committees. The fellowship curriculum is fluid and is re-evaluated yearly (formally) and *ad hoc* to keep it relevant to trainee needs and national requirements.

The core experience of the fellowship will consist in the evaluation and management of LT candidates and recipients, achieved through extensive exposure in both the in- and outpatient services. Fellows will be expected to maintain broader competency through general Hepatology Clinics and procedures (EGD, colonoscopy). If desired, these experiences can be augmented with further clinical and procedural opportunities.

Fellowship Goals & Objectives

The goal of the fellowship is to fully prepare fellows for the broad and deep complexity of LT medicine in the overarching healthcare space. There is close faculty mentorship during a multitude of multidisciplinary experiences. These experiences are highlighted by an awareness and sensitivity to the social-cultural context of patients, providers, and staff. Efforts are targeted to provide premium care and education to patients. Experiences are complemented by both formalized and individual didactic meetings. The research atmosphere, in a high-volume transplant center, facilitates broad scholarly engagement.

- A. Comprehensive evaluation and management of hepatology patients
- B. Comprehensive evaluation and management of pre-LT patients
- C. Comprehensive evaluation and management of post-LT patients
- D. Comprehensive evaluation and management of Hepatocellular carcinoma (HCC) and Cholangiocarcinoma (CCA)
- E. Appreciation for the complex interventions and evaluations by our sub-specialty colleagues and the communication required for comprehensive and efficient care of patients
- F. An appreciation for and facility with multidisciplinary evaluation and management of transplant patients; the nuances of forming consensus in group actions
- G. An appreciation for and facility with the social-cultural context in which transplant evaluation and management takes place and efforts to identify, account for, and even in some cases remedy disparities as they impact upon transplant eligibility and management
- H. Further development as an educator and/or mentor to trainees and colleagues in our local and regional communities: (1) through operational control over resident-run inpatient services; (2) and attendance and/or participation in educational/research meetings
- I. An appreciation for systemic issues that affect patient care outcomes (“quality”), and creating and/or facilitating projects that target these areas, e.g., Quality Improvement (QI) projects
- J. Maintaining and augmenting medical professionalism, in-regards to: (1) patient care; (2) faculty and staff interaction; (3) community engagement; and (4) junior trainee and colleague education
- K. Faculty and staff will serve as role-models in all these regards (*vide supra*), furthered by formal conferences and lectures provided by the DOM and Division of GI and Hepatology
- L. Per ACGME requirements, the fellow will: (1) gain facility with interpreting liver biopsies (at least 200); (2) will attend/participate in transplant surgeries (at least 3); and (3) cadaveric organ procurement (at least 1). Observing Living donor surgeries (procurement, transplant), while not required, is highly encouraged.

Beyond the technical aspects of training and patient care, there is an intangible growth that occurs in experiences such as this. To appreciate the rhythm and culture of the transplant space and its providers: to balance competing personal and professional interests in real-time, not simply for a rotation, but a long career. It behooves the fellow to take advantage of this unique opportunity at NMH, wherein diverse clinical experiences are understood and solved in multi-disciplinary fashion. The experiences and friendships built here can last a lifetime.

Progression in training

With faculty discretion, and consent of the fellow, graduated autonomy (from formal direct supervision most of the time, to part-time, to indirect supervision/independence) is manifest through (1): outpatient clinical encounters, i.e., evaluation of patients alone and development of assessment and plan; (2) in/outpatient endoscopy (diagnostic and therapeutic); (3) post-LT Nurse Rounds, i.e. the evaluation and management of acute-to-chronic outpatient clinical, blood, imaging, procedural and biopsy results; (4) Hepatology primary service, with management of patients, oversight and education of the resident team.

The assessment of fellow competency is rendered through: (1) daily feedback from faculty and/or PD; (2) end-of-rotation feedback directly from attendings (documented in NI); (3) weekly office hours with the PD; and (4) semi-annual CCC reviews (in-person; in-writing).

Clinical Services Overview

The fellowship is designed to meet the requirements of the ACGME through varied and in-depth clinical experiences (*vide infra*) over the course of 1 academic year. These experiences are divided between alternating inpatient and outpatient months. All services can function autonomously without the fellow but are certainly enhanced by them.

- A. 6 months of inpatient services; Post-LT Hepatology clinic continues
- B. 4 months of outpatient services [2 Pre-LT clinics, 2 Post-LT (Hepatology and Surgery) clinics, 1 Hepatology clinic, 2 endoscopy ½ days]
- C. ½ month Pediatric TH in/outpatient; Post-LT Hepatology clinic continues
- D. ½ month TID in/outpatient; Post-LT Hepatology clinic continues
- E. 1 month (20 working days) vacation; this does not include travel for interviews
- F. 5 days to attend national conferences
- G. Holidays: (1) outpatient fellow - off when clinics are off; (2) inpatient fellow – treat as a “Saturday:” coverage of inpatient service until 12:00 pm

Outpatient Services Daily Structure

	Monday	Tuesday	Wednesday	Thursday	Friday
AM	<p>Donor Clinic 8:00-12:00 Attendings</p> <p>Endoscopy 8:00-12:00 Kulik</p> <p>Hepatology 8:00-12:00 Boike Eswaran Ganger Hughes Kulik</p> <p>Post-LT Surgery 8:00-12:00 Attendings</p>	<p>Pre-LT Return 8:30-12:00 Attendings</p>	<p>Endoscopy 8:00-12:00 Baumann</p> <p>Hepatology 8:00-12:00 Cheung Hughes Kulik</p>	<p>Hepatology 8:00-12:00 Cheung Ganger Green Moore</p> <p>Pre-LT New 8:30-12:00 Attendings</p>	<p>Hepatology 8:00-12:00 Green Kulik</p> <p>Hepatology Conf 7:00-8:00</p> <p>Pathology Conf 8:00-8:30</p> <p>MDC 8:30-10:30</p>

PM	<p>Endoscopy 1:00-5:00 Duarte Eswaran Ganger Hughes Thaker</p> <p>HBS 1:00-4:00 Attendings</p> <p>Hepatology 1:00-5:00 Boike Eswaran Green Thaker</p> <p>Post-LT Hepatology 1:00-5:00 Moore</p>	<p>Hepatology 1:00-5:00 Ganger Hughes Thaker</p> <p>Post-LT Hepatology 1:00-5:00 Boike Duarte Eswaran Moore</p> <p>Fellows Lectures 4:30-5:30</p>	<p>Hepatology 1:00-5:00 Kulik Moore</p> <p>MAC Endoscopy 1:00-5:00 Attendings</p> <p>Post-LT Hepatology 1:00-5:00 Ganger Hughes</p>	<p>Hepatology 1:00-5:00 Duarte Ganger</p> <p>Post-LT Hepatology 1:00-5:00 Cheung Thaker</p> <p>Radiology Conf 1:00-2:00</p> <p>Case Discussions 2:00-3:00 Green</p>	<p>CTC Lectures 12:00-1:00</p> <p>Endoscopy 1:00-5:00 Moore</p>
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Locations

- A. Case Discussions: Feinberg Pavilion, 14th floor, Hepatology Resident Team Room
- B. Donor Clinic: Arkes Pavilion, 19th floor, SOTC Transplant clinic
- C. Endoscopy: Lavin Pavilion, 16th floor, Digestive Health Center (DHC) Endoscopy suites
- D. Fellows Lectures: Arkes Pavilion, 19th floor, Solid Organ Transplant Center (SOTC) conference rooms (or virtual)
- E. Hepatobiliary Surgery (HBS) clinic: Arkes Pavilion, 19th floor, SOTC Transplant clinic
- F. Radiology Conference: Arkes Pavilion, 2nd floor, Department of Radiology conference room (or virtual)
- G. Hepatology clinic: Lavin Pavilion, 16th floor, DHC Pod B1/B2
- H. Hepatology Conferences & Lectures: Arkes Pavilion, SOTC 19-083 (or virtual)
- I. John Fryer, MD CTC Lectures: Arkes Pavilion, 6th floor, conference room 6-035 (or virtual)
- J. MAC Endoscopy: Galter Pavilion, 4th floor, Endoscopy suites
- K. Multi-Disciplinary Conference (MDC): Arkes Pavilion, 19th floor, SOTC 19-083 (or virtual)
- L. Pathology Conference: Galter Pavilion, 7th floor, Pathology labs (or virtual)
- M. Pre-LT clinic (New and Return): Arkes Pavilion, 19th floor, SOTC Transplant clinic
- N. Post-LT Surgery clinic: Arkes Pavilion, 19th floor, SOTC Procedure bays
- O. Post-LT Hepatology clinic: Arkes Pavilion, 19th floor, SOTC Transplant clinic

Inpatient Services Daily Structure

Monday – Thursday: Standard schedule

7:45~8:30 am	Multidisciplinary Rounds (MDR)
8:30~11:00 am	Hepatology primary service rounds
Late morning/Afternoon	Hepatology consult service and procedures (optional)
Afternoon	Service follow-up; educate residents; administrative time

Friday: Non-standard schedule

7:00–8:00 am	Hepatology Conference & Lectures
8:00–8:30 am	Pathology Conference
8:30–10:30 am	Multidisciplinary Committee (MDC)
Morning/Afternoon	Rounding; service follow-up; educate residents; endoscopy

Saturday: Non-standard schedule

8:00 am-12:00 pm	Hepatology primary service rounds; senior arrives at noon Consults (whether transplant-related or not): GI fellows
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Sunday: Off N/A

On-Call Status

The fellow will not, in general, be expected to manage patients after 6:00 pm (whether in- or outpatient). If the inpatient GI fellow is unavailable, the TH fellow pager is forwarded to the inpatient service faculty. The fellow will not exceed the 80-hour work week (on average over 4 weeks); this has never been an issue. Fellows will actively document their weekly duty hours; non-compliance can result in temporary suspension of privileges. Moonlighting is allowed but does require PD approval: total work hours must be within ACGME regulations.

Conferences & Didactic Curriculum

Preamble for Didactics

The curriculum runs from September through June and is directed at GI and TH fellows; however, TH faculty, Hepatology advanced practice providers (APP), allied pharmacists, and all Hepatology rotators may be in attendance.

Case Discussions

This conference is geared towards IM residents who rotate through the Hepatology primary service, but nonetheless it can be useful to all GI and/or TH fellows. The team will present an inpatient vignette and then discuss salient points with Richard Green, MD. The team should confirm availability with him in the days prior. These discussions take place every Thursday from 2:00-3:00 pm, in Feinberg Pavilion, 14th floor, Hepatology Resident Team Room (or virtual).

Department of Medicine Grand Rounds

DOM Grand Rounds brings scholars of national and international renown to expound upon their research and/or discuss major issues within Medicine, Science, and US Healthcare. While these speakers address the DOM, the larger NM community is invited as well. Grand Rounds occur throughout the academic year, on Wednesdays, 12:00-1:00 pm, in Feinberg Pavilion, 3rd floor, Feinberg Conference Room (or virtual). Lunch is provided.

Fellows Lectures

These lectures, presented by NM faculty, highlight a broad array of SOT topics highly focused on clinical practice. The main target audience is transplant fellows (hepatology, nephrology and surgery), but all hepatology trainees are welcome. These lectures occur throughout the academic year, on certain Tuesdays, 4:30-5:30 pm, in Arkes Pavilion, 19th floor, SOTC conference rooms.

Hepatology Conferences & Lectures

The GI and TH fellows will attend and/or participate in weekly hour-long conferences & lectures, Fridays, 7:00-8:00 am, in Arkes Pavilion, 19th floor, SOTC 19-083 (or virtual).

- A. Didactics: faculty present core concepts in Hepatology and/or LT
- B. Bile: As a group, TH and surgeons, IR, and IGI discuss complex and/or recurrent biliary issues in our patients (mostly post-LT); TH and IGI fellows present 1-2 cases each; to add cases to the list, email Kristine Stiff, RN kristine.stiff@nm.org
- C. Journal Club: TH fellow presents 2-3 important articles, at least every semester: methods, results and relevance to clinical practice
- D. Morbidity & Mortality: TH and Transplant Surgery fellows present one case each for root-cause analysis of adverse outcomes and multidisciplinary action plans; format is 40 min discussion (every semester): (1) case summary (5 min); (2) pertinent data (5 min), and (3) participant discussion (10 min)
- E. Pathology review: TH and GI fellow present 3 cases each (10 minutes per case); focused on biopsy description and interpretation; audience participation mandatory
- F. Faculty & TH Fellow research: faculty present on their accumulated and/or on-going research; fellows will present their QI project and/or otherwise scholarly activities; the fellow portion occurs in June, with duration ~ 30 minutes

Hepatology Grand Rounds

Invited external guest faculty (3-4 per year), of national and/or international renown, speak on an area of their expertise to the Division of GI and Hepatology. These events will take place on certain Fridays, 7:00-8:00 am, in the Conference Room in Arkes Pavilion, 19th floor SOTC 19-083.

Administrative notes: This experience is usually supplemented by: (1) dinner and/or lunch with NM faculty and the invited speaker; TH fellows are encouraged attend; (2) group meeting between fellows (GI and TH) and the speaker to discuss interesting cases and/or career advice; and, (3) 1:1 meetings between NM faculty and the invited speaker; TH fellows are encouraged to meet with all speakers.

When Grand Rounds are in-person, the TH fellow will escort the visiting faculty from the Hyatt Centric Chicago Magnificent Mile, 633 North St Clair St (across from Arkes Pavilion), to the conference room.

Jon Fryer, MD CTC Lectures

These lectures focus on NIH-funded transplant research generated by faculty from NM or, more broadly, Northwestern University, and/or other institutions. The objectives include: (1) dissemination of relevant research; (2) generating multidisciplinary collaborations; and (3) more generally, to enhance faculty collegiality. The target audience includes SOT faculty and fellows, and all other Northwestern faculty and staff so interested. These lectures occur throughout the year, every 2nd Friday of the month, 12:00-1:00 pm, in Arkes Pavilion, 6th floor, Conference room 6-035 (or virtual).

Multidisciplinary Conference

The MDC comprises Transplant Surgeons and Hepatologists, Nurses, Psychiatrists, Nutritionists, Social workers, and as needed TID, Cardiology, and Oncology sub-specialists. This meeting has manifold interests: (1) it serves to review potential patients for L(K)T, seen the day prior in the Pre-LT *new* clinic; (2) reviews pending patients for L(K)T, who are being managed in the Pre-LT *return* clinic; (3) review inpatients on the Transplant Surgery and Hepatology primary services; (4) evaluation of living donors; (5) evaluation of HCC and/or CCA patients, some of whom may not be transplant eligible; and, (6) to discuss operational, administrative and ethical issues important to the Division. The outpatient fellow will present patients they staffed in the Pre-LT *new* clinic, whereas the inpatient fellow will present patients that are currently on the Hepatology primary service, or who have been on service in the last weeks. MDC occurs every Friday, 8:30-10:30 am, in Arkes Pavilion, 19th floor, SOTC 19-083 (or virtual).

Administrative notes: Fridays in particular have many activities that overlap in time, e.g., the MDC with Hepatology primary service rounds. Depending on the attending and the needs of the service, rounds may begin earlier or later than usual, and in some cases are interrupted by communications with the MDC. How to navigate this dilemma precisely is fellow dependent, but the fellow's first responsibility is to their education. Thus, regardless of service dynamics, the fellow's time for MDC (and all conferences & lectures) is protected. It is also acceptable for the fellow to participate in rounds and listen in on the MDC simultaneously. The attendings are aware of the educational primacy.

Northwestern Clinical Policies & Protocols

NM has extensive and specific LT patient protocols (*vide infra*), covering: (1) the transplant evaluation process; (2) immunosuppression management; (3) hepatobiliary cancer evaluation and management (pre- and post-LT); (4) laboratory testing (pre- and post-LT); (5) post-LT clinical and laboratory follow-up schedules; (6) ID monitoring, prophylaxis and management; (7) management of immunosuppression non-infectious complications pertaining to blood tests, biliary (e.g. strictures) and vascular (e.g. thrombosis) and parenchymal (e.g. cellular rejection) issues; and, (8) enhanced primary care management in the post-LT setting.

These protocols should be reviewed carefully and often, noting that they may in many cases extend beyond, and/or not align with published literature, and/or other transplant institutions.

Office hours

Every Friday, from 11:00 am-12:00 pm (or another agreed upon time), the fellows can meet with Christopher Moore, MD, the TH Fellowship PD. This meeting is multi-purpose: (1) for clinical questions that arise from in- and outpatient services and/or readings; (2) to further discuss and expand upon the weekly CTC videos; (3) to ensure individual wellness; and (4) facilitate feedback for improvement. The PD is always available to discuss all issues facing the fellows and the fellowship. The PD office is in Arkes Pavilion, 19th floor, SOTC 19-037.

Pathology Conference

This conference is an excellent opportunity to improve diagnostic interpretations of biopsies as pertain to both regular hepatologic issues (e.g. acute to chronic liver diseases; inflammatory patterns; and fibrosis staging), and post-LT rejection (acute and chronic) presentations. Many difficult cases, and thus nuanced management, are based on discussions at this conference. In attendance are TH and Pathology faculty and fellows. This conference is every Friday, 8:00-8:30 am, in Galter Pavilion, 7th floor, Surgical Pathology Laboratory (or virtual).

Administrative notes: The fellow should record pertinent data (e.g., anonymized ID; indication; and findings) for all liver biopsies reviewed; this will be submitted to the Program by the end of fellowship.

Quality Assurance/Performance Improvement (QAPI) Conference

This conference is a multidisciplinary meeting comprising Transplant Surgeons and Hepatologists, Nurses, Social Workers, Dietitians and Psychiatrists. QAPI seeks to assess complications, adverse outcomes and/or otherwise unexpected events that befall the LT patients. In this assessment, root cause analysis of the event(s) is performed, and an action plan is derived to eliminate and/or mitigate such occurrences (trends) in the future. QAPI occurs every 2 weeks (2nd and 4th week of the month), 8:30-9:00 am, in Arkes Pavilion, 19th floor, SOTC 19-083 (or virtual). Note that these days MDC has a modified start time.

Radiology Conference

Radiology conference is a multidisciplinary meeting comprising Transplant Surgeons and Hepatologists, Oncologists and IR. Therein the group reviews 10-20 cases. Most reviews involve patients with HCC and/or CCA (for resection, LT, and/or liver-directed therapies), but benign lesions are evaluated as well. In certain cases, pertinent HB vascular issues are discussed. Differential diagnosis, and diagnostic and treatment considerations, are the focus of this meeting. This conference provides an excellent opportunity to understand the complex anatomy and physiology that surrounds pre- and post-LT patients, and the multi-modal approach utilized (radiological and/or surgical) to manage HB diseases. The conference is every Thursday, 1:00-2:00 pm, in Arkes Pavilion, 2nd floor, Department of Radiology, Conference Room (or virtual).

Administrative notes: For cases that require discussion, contact IR PC Karen Grace, RN karen.grace@nm.org. Summaries of each patient are later collated and sent out by email the next day to all conference members.

Reading Lists

Hepatology, and Liver Transplant more generally, comprise a vast multi-disciplinary body of information in regard to theory and practice. This information is now retrieved globally, being

disseminated, digested and acted upon at a more rapid pace than ever. As such, a frequent, familiar and thoughtful relationship to the literature is critically important. While reading (“education”) is not *per se* sufficient for clinical competency, it is certainly necessary in addition to training and practice. An extensive reading list, curated by the PD, is maintained and disseminated to all rotators on a monthly basis.

Transplant Comprehensive Curriculum

Fellows have access to the Comprehensive Trainee Curriculum (CTC) videos (up to 1 hour each) (<https://www.myast.org/comprehensive-trainee-curriculum-ctc>), produced by the American Society of Transplantation (AST), covering all aspects of SOT. A comprehensive reading list of Hepatology and LT related topics is provided (and iterated) on a monthly basis.

Clinical Policies & Protocols

These protocols and policies can be accessed through the NM Interactive website: [Home - Home \(sharepoint.com\)](#), i.e., the Homepage. Therein select “Policies and Procedures” in the top headline, and then select “All Policies and Procedures,” which will take you to the “Policy Manager.” In the top headline, search for particular subjects, e.g., “liver transplant prophylaxis,” or other key terms; or type in the equivalent reference code. These protocols and policies simultaneously function as part of the fellow’s “Didactic Curriculum” (*vide supra*).

Protocols & Policies

- A. Initial Evaluation of Acute Liver Failure [30.1045]
- B. Terlipressin for Management of Hepatorenal Syndrome [18.3014]
- C. Alcohol Protocol in LT [30.1002]
- D. Organ Transplant Recipient Selection Evaluation [30.0001], Appendix D: Liver Recipient [30.0001D]
- E. Liver Cardiac Evaluation [30.1075]
- F. Liver Waitlist Management [30.0035]
- G. Initial Evaluation of HCC and CCA Pre-Transplantation [30.1046]
- H. Hepatitis C Positive Donor Protocol [30.1049]
- I. Liver Transplantation for Unresectable Colorectal Liver Metastases [30.1095]
- J. Liver Transplant Procurement: Normothermic Regional Perfusion [30.1097]
- K. Alprostadil Usage After LT [30.1005]
- L. Hepatitis B Liver or Combined Liver/Kidney Protocol [30.1078]
- M. Management of HCC and CCA Post-Transplantation [30.1048]
- N. Liver and LKT Recipient Outpatient Follow-Up Schedule [30.1032]
- O. Immunosuppression Therapeutic Drug Monitoring [30.1016]
- P. Liver Immunosuppression Protocol [30.1019]
- Q. Liver Transplant Prophylaxis [30.1027]
- R. Liver Biopsy Procedure [30.1004]
- S. Liver Biopsy for Select Adult LT Recipients Who Underwent Pediatric LT [30.1054]
- T. Identification and Management of Rejection Protocol [30.1003]
- U. Management of Leukopenia [30.1023]

V. Long-term Care and Management of the Liver, Kidney and Pancreas Transplant Recipients [30.1056]

W. NASH long-term follow-up (*vide infra*; not included in NM Protocols & Policies)

	1 month	4-6 months	1 year	2 years	3 years	4 years	5 years	6 years	7 years	8 years	9 years	10 years
Labs (to include in addition to standard labs)												
Urine protein and Cr	x	x	x	x	x	x	x	x	x	x	x	x
HgbA1c	x	x	x	x	x	x	x	x	x	x	x	x
Fasting lipid profile		x	x	x	x	x	x	x	x	x	x	x
Procedures												
Biopsy (for cause +/- 5 yr. protocol)							x					x (optional)
Imaging (select one of below LSMs)												
MRI PDFF/MRE or US ARFI			x		x		x		x			x
Fibroscan/CAP			x	x	x	x	x	x	x	x	x	x
Echocardiogram* (If h/o abnormal previous echo or symptom driven)												
Questionnaires (if patient consented to registry)												
CARDIA Y30 (Sedentary Behavior)	x	x	x	x	x	x	x	x	x	x	x	x
PROMIS 29 (Ability to Participate in Social Roles and Activities)	x	x	x	x	x	x	x	x	x	x	x	x
Willet 80 out (Dietary Assessment)	x	x	x	x	x	x	x	x	x	x	x	x

Inpatient Services

Preamble

The NMH SOT Services are administratively divided into medical and surgical services, which each have pre- and post-LT components for Liver and Kidney patients. Pertinently, for inpatients needing a LT and/or a simultaneous liver and kidney transplant (SLKT), two broad categories exist: (1) Hepatology primary service for pre-L(K)T and long-term ($\geq 1m$) post patients who are suitable for a medical floor (*vide infra*); (2) Transplant surgical service covers immediate post-op care to ~ 1 month; and/or otherwise long-term patients with primary surgical complications (*vide infra*). Depending on acuity, whether pre- or post-LT, shared patients may be on the “floor” (Feinberg Pavilion, 14th floor, East) or a variety of ICUs. Thus, depending on the patient's acuity, and/or their time from L(K)T, the TH personnel involved will either function as a primary service, or as a consultant. Further, all surgical issues, whether transplant-related or not, can be directed to the Transplant Surgery service to intervene or triage to other surgery services.

Hepatology Consult Service

Patients on the Hepatology consult service fall into these general categories: (1) acute and/or chronic HB diseases that are ineligible and/or inappropriate for LT; (2) long-term post-LT recipients admitted for non-transplant issues, with otherwise stable graft function; and (3) hepatic risk assessment for non-LT surgeries. This service is managed directly by the GI fellow, with the (sometimes) assistance of a senior resident and/or APP and staffed directly with the service faculty

of the week. These rounds occur daily, in the late morning and/or afternoon; patients are housed in all hospital pavilions.

Importantly, for pre/post-LT ICU patients, and/or otherwise post-LT patients, the TH fellow may indeed be the primary consultant (schedule permitting, otherwise defaulting to the GI fellow).

Administrative notes: in relation to the Hepatology consult service, the fellow will: (1) monitor this service generally; (2) advise the GI fellow for workflow assistance/education; (3) may assist in coordination-of-care *ad hoc* with allied consultants, e.g., IR (imaging review, procedures); social work (evaluation of patients who may be appropriate for transplant evaluation); (4) otherwise identifying patients who may be more appropriate for the Hepatology primary service (e.g. intensive diuresis); and, more generally (5) service faculty discretion.

Hepatology Primary Service

Hepatology primary service houses up to 12 patients, under the direct management of the service faculty and TH fellow who supervise a resident team (2-3 interns and 1 senior). Interns and residents will admit, manage, present, and discharge all patients. Detailed assessment and management of the following will occur: (1) active medical issues for which they are admitted; (2) issues affecting listing capability or maintenance across these domains: (a) medical; (b) surgical; (c) frailty and rehabilitation; (d) psycho-social; and (e) financial [handled through the Pre-LT offices].

Given the complex nature of these patients, a number of allied consultants are commonly involved: (1) TID will assist with nuanced management of complex and/or atypical infections, particularly in the immuno-suppressed state; (2) Transplant Nephrology, as relates to volume management with diuretics and acute kidney injury, chronic kidney disease, and determination of KT eligibility; (3) IGI will assist with biliary complications (including transgastric biopsy), particularly in post-LT patients; (4) IR will assist with TIPS, vascular and biliary access, and HCC/CCA liver-directed therapies; fluid removal through thorax/paracentesis; (5) Transplant Surgery will manage all surgical issues (an can triage to allied surgical services *ad hoc*) and/or vascular issues affecting the post-LT hepatic artery and splanchnic veins (in conjunction with IR); (6) PT and Nutrition Service – almost universally consulted on these patients given their advanced disease state and deconditioning; and, (7) Psychiatry – their evaluation, in conjunction with Transplant Social Work, particularly for patients with alcohol-related liver disease, is essential in assessing for post-LT success. Hepatology primary service rounds take place daily, 8:30-11:00 am, in Feinberg Pavilion, 14th floor, East.

Administrative notes: The TH fellow is expected to have up-to-date and detailed knowledge of all patients, for both immediate issues and if pre-LT, then listing status (studies required for, or maintenance of) and living donor status (as applicable). Overall, the fellow will gain the experience of managing a broad spectrum of inpatient pre- and post-LT issues. The fellow serves several critical roles: (1) facilitating communication between the faculty and residents; (2) helping the residents to understand the complex multidisciplinary patient issues; (3) ensuring proper communication with consultants and transplant staff; and (4) providing an essential continuity-of-care function for these complex patients (faculty rotate on a weekly basis).

The fellow is to communicate with: (1) pre-LT nurses daily regarding patient medical and listing issues; and (2) post-LT nurses whenever transplanted patients are discharged – to ensure safe continuity-of-care. In general, all endoscopic procedures for this service will be performed by the Hepatology consult service GI fellow (*vide infra*). In some cases, the TH fellow may perform these procedures and/or provide oversight to the GI fellow during the procedure. The pre- and post-LT nursing staff are located in Arkes Pavilion, 19th floor, SOTC.

Multidisciplinary Rounds

MDR is utilized to discuss all patients housed on the transplant services (*vide supra*). The groups represented at MDR include (1) TH, Transplant Surgery, Transplant Nephrology, TID faculty and fellows; (2) Inpatient Social Services; (3) post-LT nurse coordinators; and (4) Surgical ICU attending. The respective fellows will briefly present on their service (and notable patients on consults): (1) active medical issues; (2) issues affecting listing capability or maintenance across these domains: (a) medical; (b) surgical; (c) frailty and rehabilitation; (d) psycho-social; and (e) financial. These rounds occur daily, 7:45-8:30 am, in Feinberg Pavilion, 7th floor, CTICU conference room (or virtual).

Administrative notes: The MDR represents a significant opportunity for the education and overall training of the fellow in understanding the complex nature of these patients: (1) developing concise, substantive presentations; (2) effective communication with consultants; (3) learning from consultants regarding the unique complications and nuanced management in these patients; and (4) learning to communicate and collaborate towards consensus management.

Outpatient Clinics

Donor Clinic

The donor clinic evaluates individuals who are interested to donate a piece of their liver, usually the right lobe, to a recipient, whose medical illness is not being captured sufficiently by calculated or exception MELD scores (“MELD limbo”). Donation may to a known recipient (“directed”) or unknown recipient (“non-directed”). There are a number of restrictions upon donors (age, BMI, compatible blood type) and must be otherwise in very good health. Even so, the majority are found not to be eligible as they progress through the phases of evaluation (medical, surgical, financial, frailty and psycho-social) – similarly rigorous as it would be for a recipient. Usually, 1-4 donors are evaluated every week, by a variety of TH, Transplant Surgery and Psychiatry Faculty and Social Workers. These clinics occur every Monday, 8:00 am-12:00 pm, in Arkes Pavilion, 19th floor, SOTC Transplant clinic

Administrative note: While this clinic is not a formal ACGME requirement, and not available at all Transplant programs – it is a very valuable experience in the comprehensive evaluation of the fellow. Email Lori Clark, RN LClark@nm.org regarding availability and access to the clinic.

Hepatobiliary Surgery Clinic

The HBS clinic evaluates both benign and malignant HB lesions for optimal radiologic and/or surgical intervention. The clinic can assist with all patients regardless of transplant status, and in fact may be the default pathway for those not appropriate for it. The clinic is staffed jointly by TH,

Transplant Surgery, Oncology and IR. Given the nature of the disease, anatomic access, and patient comorbidities, this clinic will utilize advanced techniques in nuanced ways, in many cases, beyond what one would expect (or even be considered) from guidelines. These clinics occur on Mondays, 1:00-5:00 pm, Arkes Pavilion, 19th floor, SOTC Transplant Clinic.

Administrative notes: This clinic, while not part of the standard fellow curriculum, is of obvious utility to all parts of Hepatology. Fellows are encouraged to attend, as far as it does not conflict with their mandated responsibilities.

Hepatology Clinic

The Hepatology Clinic evaluates acute to chronic HB injury and/or disease including compensated and decompensated cirrhosis, and HB lesions and cancers. Patients remain here as far as they remain medically controlled, or ineligible, or uninterested in LT evaluation. This clinic is for both “new” and “return” patients; though invariably patients being discharged from the Hepatology primary or consult services will be “returns” – having been staffed formally during the inpatient stay. By nature, the majority of Hepatology primary service patients will follow up in the Pre-LT clinic (*new* or *return*) (*vide infra*). However, if deemed not a pre-LT candidate, patients will become Hepatology clinic patients. This clinic occurs every day (date and time are attending specific), in Lavin Pavilion, 16th floor, DHC Pod B1/B2.

Administrative notes: residents will discuss with the Hepatology primary service faculty and/or the TH fellow to determine which provider will manage this patient in the outpatient setting. A patient on the Hepatology consult service should follow-up with the attending who staffed the original consultation (not the discharging attending). If there are no available appointments within the requested timeframe at the time required, contact that specific clinic faculty for directions; in many instances patients can also follow up with the faculty-attached APPs.

The fellow participates in this clinic during their outpatient service months. In particular, the fellows will be assigned to an attending for a 3-month period; thus, a total of 4 attendings. During inpatient months, this clinic is optional, and as such, fellow availability would be determined by their inpatient responsibilities and the timing of this clinic. Assignments will be distributed during orientation.

While the bulk of this fellowship deals with issues related to the pre- and post-LT experiences, solidifying, and augmenting general hepatology knowledge is especially important. It not only informs the LT experience but is also crucial for the long-term successful practice of any hepatologist regardless of their professional trajectory.

Post-LT Hepatology Clinic

This Post-LT Hepatology clinic handles: (1) monitoring of graft, vascular and biliary function; (2) immunosuppression medications and side-effects; (3) infectious prophylaxis and infectious complications; (4) nutrition; (5) kidney function and volume management; and (6) primary care issues, exacerbated by immunosuppression. Patients are seen in the Post-LT Hepatology clinic approximately 4 weeks after their LT, in all cases after they have been through the Post-LT Surgery clinic (*vide infra*). 8-12 patients are seen in a typical clinic. A full support staff is available to carry out management plans and follow-up with the patients. These clinics occur daily (faculty specific) except Fridays, 1:00-5:00 pm, in Arkes Pavilion, 19th floor, SOTC Transplant clinic.

Administrative notes: When the fellow is inpatient, they are responsible for ensuring residents send timely and correct discharge plans (follow-up, and summary of hospitalization) to the post-LT nurses (via Epic). If no fellow is in service that month, then the residents will handle this, with support from the inpatient service faculty, or the patient's primary TH faculty physician.

This is a continuity clinic throughout the fellowship, excepting vacation. The fellows will be assigned to an attending for a 3-month period; thus, a total of 4 attendings. Assignments will be distributed during orientation. No orders or results will go to the fellows directly.

Post-LT Nursing Rounds

There is a vast amount of data compiling on post-LT patients (rapidly with new patients, and more slowly with longer term patients, into perpetuity). This data comprises: (1) transplant surgical and immuno-suppressive issues; (2) primary care issues intersecting with transplant; (3) psychosocial issues; and (4) financial and occupational issues. Interpretation and action upon this data requires nuanced understanding of the patient's history, current medical status, and a practical sense of utility for both the patient's health and broader healthcare limitations.

As fellow efficiency and competency increase, they with their supervising faculty, can calibrate more clinical effort. Messages to the fellows should be returned to the sending faculty within 24 hours. No first orders or results will go to the fellows directly unless the fellows prefer that. The bulk of the "rounds" are now virtual (EPIC mychart messages) for both fellows throughout the year, but there are still daily in-person rounds for fellows and attendings (time to be agreed upon, duration < 15 minutes). Daily rounds will be covered by the outpatient fellow (though the fellows can decide coverage distribution). These rounds take place in Arkes Pavilion, 19th floor, SOTC Quiet Room (or virtually).

Administrative notes: Fellows are assigned to a TH faculty for 3 months at a time; thus, a total of 4 for the fellowship. Assignments will be given at orientation. Post-LT nurses and faculty can send up to 5 unique patient issues (an issue may contain multiple messages back-and-forth) per day to fellows.

Post-LT Surgery Clinic

After patients have undergone LT and are discharged from the hospital, they will enter the Post-LT Surgery Clinic (within < 7 days). This clinic is staffed by the TH fellow, assisted by post-LT nurses, and staffed with Transplant Surgery faculty. The census is usually 3-8 patients. Several complex issues are managed: (1) immunosuppression medications and side-effects; (2) infectious prophylaxis and infectious complications; (3) nutrition; (4) kidney function and volume management; and (5) surgical complications. This clinic may also contain long-term LT patients with recent surgical complications, and/or are otherwise deemed to warrant evaluation, at the discretion of the requesting faculty.

It is the case that the details of the donor, the graft, the anatomic connections, and the immediate post-operative complications may have significant and long-standing consequences for the patient. Thus, expertise with this critical and complex surgical-medical state is vital to understanding the

patient's trajectory and natural history. This clinic takes place on Mondays, 8:00 am-12:00 pm, in Arkes Pavilion, 19th floor, SOTC Transplant Procedure bays.

Administrative notes: Fellows are exempt during their external rotations and vacation. Historically, outpatient fellows have found less utility for this clinic in the latter half of the academic year and thus can attend every other week. Note, the workflow is at the discretion of the staffing faculty, however a comprehensive “Post-LT Surgery Clinic Template” (containing all pertinent queries to complete the note) will be provided during Orientation. For questions regarding faculty staffing *du jour*, and or absences to this clinic, please contact operations coordinator administrator, Carla Gamble carla.gamble@nm.org. For urgent issues regarding staffing, please contact Christopher Moore, MD.

Pre-LT New & Return Clinics

The Pre-LT *new* clinic evaluates decompensated cirrhotic and/or HB cancer patients who could benefit from L(K)T. Usually 4-6 patients are evaluated by a multidisciplinary team that includes Transplant Surgery, TH, Psychiatry, Physical Therapy, Nutrition, and Social Services. Depending on the particular dates, different TH faculty will staff patients. Patients may be referred from: (1) Hepatology clinic at NMH; (2) GI clinics or NM Hepatology satellites in the Chicagoland and Northwest Indiana areas; (3) second opinions from other LT centers; and (4) international partners, e.g., the United Arab Emirates. Management of acute to chronic hepatologic complications, and overall appropriateness (medical, surgical, financial, frailty and psycho-social) for further LT evaluation and/or listing are considered and engaged. If deemed appropriate for further evaluation, the patients will follow up in the Pre-LT *return* Clinic, also staffed by the same multidisciplinary team, as mentioned. This clinic, comprising usually 8-16 patients. It continues the management of the patient's acute to chronic conditions, while simultaneously working up, completing and/or maintaining their listing status. Both clinics are from 8:00 am-12:00 pm (*new* – Thursdays and *return* – Tuesdays), located in Arkes Pavilion, 19th floor, SOTC Transplant clinic.

Administrative notes: Fellows will see patients individually and staff with faculty *du jour*. A full support staff, including pre-LT coordinators, are available to carry out management plans and follow-up with the patients. These patients are discussed by the faculty (or by the TH fellow if staffed with the former) on Fridays, 8:30-10:30 am, at the MDC (*vide supra*). No orders or results will go to the fellows directly, unless initially distributed by the staffing faculty; or prior agreed upon with the fellow.

Satellite Clinics

Satellite clinics allow patients (Pre- and Post-LT and Hepatology) who live far away to be seen conveniently by our Hepatology group (faculty and/or APPs). Each clinic is staffed differently, and appropriateness for the clinic is determined uniquely. These clinics occur all over the Chicagoland and Northwest Indiana areas.

Administrative notes: Scheduling this clinic should be approved by the particular faculty and/or APP of that clinic.

In general, fellows do not staff these clinics; however, if the fellow has a particular interest in accessing a clinic, or under extraordinary staffing issues, the fellow may certainly join, or their presence be requested, respectively.

Urgent Evaluation Clinic

This Urgent Evaluation clinic is activated (*ad hoc*) to determine if a “return” pre- or post-LT patient requires direct admission to the Hepatology primary service, thus bypassing the Emergency Department. These evaluations typically occur a few times per month (scheduled usually in the days prior, or even the same day). An available TH fellow will be alerted beforehand to evaluate the patient. Ultimate decisions will be made in conjunction with both the patient’s primary outpatient Hepatologist and the Hepatology primary service. These urgent visits only require a verbal sign-out to the Hepatology primary service. This clinic takes place *ad hoc* (Monday through Friday, 8:00 am-3:00 pm) in Arkes Pavilion, 19th floor, SOTC Procedure bays.

Elective Experiences

Pediatric Transplant Hepatology Rotation

LCH, has a large pediatric LT program that has close collaborations NMH. This rotation will address the nuanced issues of Pediatric TH: (1) etiologies and management of advanced liver disease; (2) immunosuppressive medications and complications; (3) procedural/surgical complications; and (4) the psycho-social environment surrounding the patients. This rotation lasts 2 weeks and is to take place during the second half of the academic year. It will comprise both in and outpatient services. These services are staffed by Pediatric TH faculty and their fellows.

Administrative notes: the fellow’s Post-LT Hepatology clinic will continue throughout this rotation. This rotation should be planned a few months in advance with Catherine Chapin, MD (Pediatric TH Fellowship PD) CChapin@luriechildrens.org. These services will be entirely provided within LCH, which is adjacent to NMH.

Transplant Infectious Diseases Rotation

Given the nature of our pre/post-LT patients, a wide variety of infectious complications are manifest, in many cases with atypical, and/or more severe presentations. This rotation lasts 2 weeks and is to take place during the second half of the academic year. It will comprise both in- and outpatient services. During the inpatient component, the fellow is part of the TID consultative service, which usually has TID fellows and Internal Medicine residents on it. The outpatient component comprises pre- and post-LT patients seen for a variety of active and preventative infectious issues.

Administrative notes: The fellow’s Post-LT Hepatology clinic will continue throughout this rotation. This rotation should be planned a few months in advance with Michael Angarone, DO mangaron@nm.org. Outpatient services will be in Arkes Pavilion, Suite 940; whereas inpatient rounds are decentralized and encompass all pavilions of the hospital.

Supplemental Services

Fellows will gain significant working knowledge of associated sub-specialties, including Transplant Nephrology (acute kidney injury, hepato-renal syndrome, chronic kidney disease, renal replacement therapies, indications for SLKT, post-LT kidney injury) and IR (chemo and/or radio-embolization (Y-90) for HCC and other lesions; TIPS \pm shunt embolization for bleeding or other portal hypertension complications). There is daily collaboration between the subspecialty faculty and fellows throughout the year in managing these complex patients. However, if specific, more in-depth training is requested, *intra-mural* 1-week rotations can be obtained, insofar as the other requirements of the fellowship are met.

Interested fellows can participate in detailed immunologic discussions as related to organ (tissue) typing/matching, transplant, and rejection with the Transplant Immunohistology Laboratory group. Fellows can contact Transplant Immunology Laboratory Director, Anat Tambur, PhD a-tambur@northwestern.edu throughout the year to set-up meetings.

Procedures

Preamble

Hepatology faculty can, in general, perform EGDs, colonoscopies (diagnostic and therapeutic). However, as a practical matter for inpatients: (1) general GI service will perform colonoscopies; and (2) IR, and to a lesser extent, IGI, will perform all inpatient liver biopsies depending on the context. The detail, timing and overall appropriateness of procedures can be confirmed with the Hepatology service faculty.

Administrative notes: scheduling of any inpatient endoscopies should go through the GI fellow, who directly manages the Hepatology consult service, and observes upon the Hepatology primary service. In general, it is this GI fellow who is performing the EGD and colonoscopies, regardless of the Hepatology or GI faculty staffing the case.

Regarding procedures, no orders or results will go to the fellows by default. Nonetheless, it is encouraged that the fellow follow-up on these patients and their results – ensuring they are interpreted and acted upon in a timely fashion. The fellow is to keep a detailed record of their procedures, most importantly: (1) biopsies reviewed; (2), though separate from the above, organ cadaveric procurements, and transplants; and (3) endoscopic procedures. These details are invariably requested by institutions for the purposes of hiring, maintaining, and/or advancing faculty through academic appointments, regardless of ACGME requirements for the fellowship *per se*.

If official requirements are not met: (1) the program will deem competency based upon the quality and quantity of the completed procedures and their related management; and (2) the immediate post-fellowship hiring institution will be alerted so as to adjust allowed privileges and/or facilitate *in situ* training towards competency.

Endoscopy

Fellows perform endoscopy (colonoscopy and/or EGD) under the supervision of GI and Hepatology faculty. In regard to Hepatology, exposure to, indications for, nuances of, and complications of endoscopy are emphasized. Moreover, given the gravitation for complicated patient scenarios to this institution, the fellow can expect to increase their facility with EGD performance in these particular aspects: (1) severe thrombocytopenia; (2) iatrogenic anticoagulation; (3) nuanced variceal banding techniques; and (4) practical real-time triaging towards IGI and/or IR procedures, e.g., TIPS.

Procedures take place either in Lavin Pavilion, 16th Floor, DHC Endoscopy suites (mostly low-acuity MAC cases; conscious sedation), or, Galter Pavilion, 4th floor, Endoscopy suites (all MAC cases, all acuity levels). All inpatients are *de jure* MAC in Galter Pavilion. In general, inform faculty prior to joining them for procedures.

Administrative notes: fellows throughout the year (heavily during outpatient months) are expected to assist Alexandra Baumann, MD on Wednesday mornings (EGD and colonoscopy), and Christopher Moore, MD, Friday afternoons (EGD) both in Lavin Pavilion. There are Galter sessions with TH faculty *du jour*, Wednesday afternoons (EGD and colonoscopy) in Galter Pavilion. TH fellows will not usually perform endoscopy on inpatient services – reserved for the GI fellow on the Hepatology consult service.

Transplant Surgery and Organ Procurement

The fellows will participate in transplant surgeries (at least 3) and cadaveric organ procurement (at least 1; more are encouraged, in particular to observe upon DCD or Living donors (LD)). Surgical activities should be undertaken during November - May. Operations will take place in Feinberg Pavilion, 7th floor, Operating Rooms. Fellows must coordinate and adjust as needed for appropriate coverage of their inpatient and/or outpatient obligations. LDLTs are scheduled months in advance; email Lori Clark, RN LClark@nm.org for access.

Further, if the fellow should ultimately pursue the role of Medical Director of LT as part of their faculty trajectory, per UNOS regulations, 3 procurements are required.

Scholarly Activities

This is a clinical fellowship, and as such, formal primary research is not a requirement. However, one *intra-mural* QI project is required and to be submitted to the Program by the end of fellowship. Publishable scholarship is strongly encouraged, and many opportunities are available given the varied interests and volume of faculty research. With the fellow's schedule, there is ample time to generate a successful QI project and publish scholarly work.

Fellows are highly encouraged to attend national conferences, e.g. the annual AASLD Liver Conference, whether presenting research or not. In particular, fellows should plan to attend the AST Fellows Symposium on Transplantation.

Administrative notes: The PD will periodically review scholarly activity to ensure and facilitate progress. Results are to be presented during the TH Fellows Symposium (*vide supra*).

Fellowship Committees

Fellows will participate in two formal *intra-mural* committees that are administratively aligned with analogs to the GI fellowship. This fellowship is a logical extension of the GI fellowship (conceptually and operationally with shared pathophysiologies, procedures, and supervising faculty and staff) and thus shared resources for these committees are utilized.

The Program Evaluation Committee (PEC)

The PEC formally meets in July to evaluate the fellowship along these domains: (1) current status; (2) strengths and deficiencies; and (3) implementation of corrective action plans. Additionally, the fellowship is assessed and adjusted throughout the year via feedback sessions that occur as part of weekly Office Hours (*vide supra*), and otherwise *ad hoc* feedback from the faculty to the PD. This committee is composed of TH PD Christopher Moore, MD, Associate PD Sarang Thaker, MD, MS, and PC Angela Tucker. One TH fellow will serve as a liaison to the Committee.

The Wellness Committee (WC)

The WC formally meets annually to evaluate the overall well-being (*vide infra*) of the fellows. This committee is composed of GI Fellowship PD Leila Kia, MD, TH PD Christopher Moore, MD and GI and TH Fellowship PC Angela Tucker. One TH fellow will serve as a liaison to the Committee.

Wellness

The physical and psychological wellness of the fellows are top priorities at NM. There is a continuous directive to understand and meet the needs of fellows in a complex and changing training environment. Wellness, in the trainee space, comprises in part: (1) a psychological state, without a debilitating distress, elicited by and through the education and clinical experiences; (2) a more generalized sense of work-life balance; (3) collegial and productive relations with other trainees, faculty and staff; and (4) a positive outlook in regard to future endeavors.

Wellness is assessed and adjusted through various manifestations: (1) 1:1 dialogue between fellows and faculty during shared clinical encounters; (2) weekly Office Hours between the fellows and PD, and *ad hoc* daily; (3) as part of the annual WC and semi-annual CCC meetings; and (4) monthly Program wellness events (subsidized), near or on campus. Furthermore, a Northwestern Graduate Medical Education (GME) Internal Review committee meets yearly with fellows and faculty (separately) to assess, amongst other qualities, the overall fellow's wellness, and the compliance of our program with the expectations set forth by the GME Office and the ACGME. Historical review of such data has demonstrated that our program maintains excellent fellow well-being.

McGaw Wellness Program

mcgawwellness@meridianproviders.com (312) 477-2109

Per NW McGaw: “With a commitment to help make mental healthcare accessible for residents and fellows, McGaw’s Wellness Program is available without cost to McGaw-appointed trainees. Except in cases of imminent harm, conversations are fully confidential. If ongoing treatment is needed, the Program will connect you with a local psychiatrist, therapist, or provider who meets your particular needs. If struggling with a mental health issue, please consider reaching out of help. These problems do have solutions, and they are easier to manage together. A response to an inquiry should be received within 48 hours.”

Time-off/Absences

During the fellowship there is 1 month (20 working days) vacation time allotted; it is an ACGME mandate that fellows utilize this entirely. These days should be taken off during outpatient blocks. If there are two fellows, they should not take vacation at the same time. Inform the relevant faculty and/or staff (for clinics, procedures) of absences as soon as possible. As these arrangements can take some time, plan for absences, and commensurate coverage as needed, at least 1 month in advance. Sign-over the pager to the co-fellow (if extant) and implement the relevant restrictions to Epic and work email.

Attendance at national and international conferences is encouraged (up to 5 working days). It is understood that inpatient responsibilities may conflict with the ability to attend – though unlikely. As such, plan accordingly with affected faculty and staff, at least a month in advance. Reimbursements regarding academic travel should be proactively discussed with the PC to understand the degree of current financial coverage and/or appropriateness.

Research Trials

There are a number of active research (in and outpatient) trials under the administration of the faculty. Awareness of these trials is useful for a number of reasons: (1) maintaining and expanding clinical and scientific knowledge in the field; (2) potential participation in the research, with authorship in publications; (3) building mentorship with the faculty; and (4) identifying both in- and outpatients for inclusion in trials that may in fact yield immediate benefits.

Administrative notes: To see all current trials through EPIC (type dot phrase): “.HEPATOLOGYSTUDIES”. For further information, contact research coordinators via EPIC staff messaging (type): “Hepatology Clinical Research Pool”.

Professional Associations

Fellows should apply and maintain membership in at least two societies, the AASLD and the AST. Besides the obvious intellectual and professional benefits, membership is required to access a number of activities: (1) AST Fellows Symposium on Transplantation; (2) the AST online CTC modules – standardized learning for the board examination; see the “Didactic Curriculum” section (*vide supra*); (3) eligibility and access to the official AASLD and AST annual meetings (in-person

or virtual); and, (4) AASLD Advanced/Transplant Hepatology Awards; encompassing travel and career development aspects – note that this is usually accessed and applied for in the year preceding the TH fellowship, so as to start concurrent with matriculation.

Administrative notes: The DOM will reimburse membership fees; fellows should submit to the Program expeditiously. Depending upon level of participation in national meetings, and annual DOM discretionary funding, significant or whole reimbursement for travel costs may be possible.

Preparation for After Fellowship

Part of the fellowship involves securing the next position after graduation, either through a faculty or private practice pathway. The vast majority of our graduates acquire a clinical educator faculty position. In either pathway, the degree of transplant-specific effort is highly variable. Such is the variety of opportunities, and more so interests of the graduates, that there is a national push to change the name of the fellowship from “transplant hepatology” to “advanced hepatology.” The PD and faculty will provide strategic advice and other forms of assistance through the application and interview process – a process quite different from prior trainee employment transitions.

Before contacting employers, plan specific meetings with the PD and the faculty regarding this process. The faculty are experienced, influential and have relationships with all major academic centers in the country and private practice groups in the Chicagoland area. Thus, the faculty will provide: (1) granular guidance in applying for high-quality positions; and (2) communications, on the applicant’s behalf, to the employer, will be a critical element in securing an offer. Furthermore, our alumni are interested in assisting the fellows in this process. Networking, whether from fellow to faculty, or faculty to faculty are truly important in this way. Thus, proactively keep the PD and faculty apprised of the application process.

Accommodation can be easily done so that interview times (in-person or virtual) are not compromised by clinical duties and will not require utilization of vacation time. Planning and faculty meetings usually begin in August, with interviews to follow - lasting into the first quarter of the year. In most cases, offerings will be made in the first quarter of the year, but there is a large variation due to institutional inertia.

After receipt of an offer and/or contract, the Program is also interested in reviewing it with the applicant. Some important points to remember: (1) maintain a continuous dialogue with the PD and the faculty so that navigation and success are optimized; (2) alert the PD to any issues immediately, and meet all deadlines; (3) in regards to employment and lifestyle, the fellow should always consider themselves (and their family first); disregard perceived allegiances from institutions or faculty or PD, whether implied or expressed; and, (4) the fellow has the full support, confidence, and confidentiality of the PD in whichever pathway is chosen.

Traveling Fellowship

NM has continued to forge international healthcare partnerships, and a felicitous result has been the opportunity for TH fellows to engage in a fellowship abroad. Our transplant program has close relationships (clinical, research, and education) with: (1) Barcelona Clinic Liver Cancer (BCLC) at the Hospital Clinic of Barcelona, Spain; and (2) King Faisal Specialist Hospital (KFSH) in Riyadh, Saudi Arabia. These fellowships are exceptional experiences professionally and personally.

This fellowship is for fellows who are both interested, and, deemed appropriate for it by the TH Fellowship PD – considering fellow technical and professional performance throughout the academic year. Applicants will submit a statement (< 1 page) addressing: (1) weekly structure – inpatient, outpatient, procedures); and (2) goals of their fellowship (clinical or scholarly). Fellowships may not be available or fundable every year. They would occur in the Spring for 2-4 weeks – administratively equivalent to an outpatient rotation. There will be no alteration to graduation times or obligations.

Expenses are paid for through the TH fellowship (\$1500 per month), and/or (if that fund has been exhausted, e.g., for travel to national meetings) with DOM discretionary funding. This latter funding is variable depending on competing larger budget constraints. Usually such funds will cover housing, airfare, and food costs (*vide infra* for details).

This fellowship is also facilitated strategically through our close partnership with NM International Health, under PD Lindsey Kreutzer. Her officers can assist with securing optimal airfare and travel arrangements (mileage points), and Visas (country specific). Passports should be up to date.

Another support mechanism for expenses is through The Medvin Fellowship. It is funded by the family of a grateful LT patient. The goal is to financially support one current fellow in the Transplant programs (Hepatology, Nephrology or Surgery) for an external fellowship at an allied institution: (1) to learn institutional methods of practice; (2) potential for scholarly work and research; and (3) fostering professional and institutional relationships. The application process is minimal.

Reimbursement Policy

Memberships

The fellow is eligible to submit two reimbursements for membership dues each academic year.

Conferences

The fellow is able to attend a conference of their choosing, with reimbursement of up to \$1500. Eligible particular expenses include:

- A. Conference (in-person, or virtual) registration
- B. Air Travel (flight receipts with ticket number; proof of payment; conference flyer)
- C. Ground Travel (taxi, ride-share, buses, trains)
- D. Meals (\$65 or less; alcohol, if purchased by the glass)
- E. Accommodation (hotel receipt with proof of payment and \$0 balance)

Reimbursement Timeframe and Method

Fellows have 60 days (from expense date), and before the end of fellowship, to email the PC with receipts for reimbursement. All receipts should be itemized and explained, and show proof of payment, and be in a single PDF.

National Health Crisis Modifications

Preamble

The COVID-19 pandemic brought about unprecedented healthcare pressures with hospitalizations. As such, significant dislocations occurred: (1) numerous clinical services were transformed (and thus trainee efforts re-allocated) to manage this crisis; and (2) trainees themselves becoming infected (and quarantined), which immediately affected all services, including Transplant. Thus, numerous adaptations were implemented for all trainees, to both maintain their safety, wellness, and clinical education, whilst still providing proper care to patients. Protocols were generated for COVID-19 to address these issues and adapted to future national health crises.

Hepatology primary service census: resident support, and thus the census, are subject to change; the former is determined by Internal Medicine Residency PD and the DOM, and the latter by the TH faculty. TH fellow roles may be expanded to those traditionally assigned to residents. To offset this strain on training and overall wellness, supplementary personal and/or work-hour modifications will be made *ad hoc*. If Hepatology primary service is full, overflow patients will go to Hepatology consult service: these are still managed by the fellow (as a consultant) and staffed with faculty – as a traditional consult would be.

Quarantine workflow for fellows

The decision to return to work is decided by Northwestern Corporate Health policies, without exceptions.

Two-Fellow Algorithm

- A. If the inpatient fellow is quarantined (“quarantined fellow”); then the outpatient fellow (“non-quarantined fellow”) takes over all in-patient responsibilities
- B. How the non-quarantined fellow is utilized in the inpatient role is determined by the inpatient service faculty; the ability of the non-quarantined fellow to continue their traditional outpatient role (e.g., endoscopy) is also determined by the inpatient service faculty
- C. The quarantined fellow (if not too ill; self-determined) will take over outpatient roles virtually – particularly important would be: (a) Post-LT Hepatology clinic; (b) Post-LT Surgery clinic; and (c) Post-LT Nursing rounds
- D. If the outpatient fellow is quarantined, then: (a) inpatient staffing and responsibilities stays the same; and (b) outpatient staffing and responsibilities are modified as per item (C)
- E. The non-quarantined fellow (if originally designated the outpatient fellow) should count *ad hoc* inpatient days as true inpatient days; as such, these days should be reciprocated by the co-fellow within the quarter (subsequent 3 months) to maintain equity

One-Fellow Algorithm

- A. If the fellow is quarantined during inpatient services, the attending will take over their responsibilities
- B. The quarantined fellow (if not too ill; self-determined) may participate virtually with the Hepatology primary services, at their discretion; this can involve communicating with the residents: (a) pre-rounds review and guidance for overnight events and/or admissions; (b) post-rounds review and guidance; (c) afternoon review of work-flow issues and/or new admissions; and (d) education
- C. Similarly, if the fellow is quarantined during outpatient services, (if not too ill; self-determined), they may participate in clinics and/or allied services virtually (see Two-Fellow Algorithm (C))

Northwestern Medical Campus Map

