UNIVERSITY OF NEBRASKA MEDICAL CENTER

CARDIOLOGY FELLOWSHIP MANUAL 2010-2011

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FACILITIES AND RESOURCES

The Inpatient facilities utilized in the UNMC Cardiology training program consist of two hospitals. University hospital is the primary facility and is a 300 bed tertiary care center adjacent to the University of Nebraska Medical.

In addition to the residency program in Internal Medicine, the medical center has residency training programs in surgery, family practice, pathology, radiology, obstetrics/gynecology, pediatrics, psychiatry, emergency medicine and anesthesiology. Within the Department of Internal Medicine, the Medical Center has subspecialty training programs in cardiology, interventional cardiology, clinical cardiac electrophysiology, pulmonary medicine, hematology/oncology, neurology and gastroenterology.

The Division of Cardiology currently has three dedicated cardiac catheterization laboratories that perform approximately 1,700 procedures (hemodynamic, angiographic and interventional studies) per year. A separate laboratory is dedicated to invasive electrophysiology and performs approximately 600 procedures (ventricular and superventricular studies, radio-frequency ablations, defibrillator testing, pacer and ICD implantation) per year. The UNMC Heart Station serves as the site for noninvasive testing and performs approximately 17,000 electrocardiograms; 8,600 echocardiograms and Doppler studies as well as 1,200 ECG stress tests (a large fraction of which utilize echocardiographic or radio nuclide imaging) per year.

A modern peripheral vascular disease laboratory (under the direction of the Department of Surgery) provides the full range of IPG, Doppler and 2-dimensional sonographic studies required to assess peripheral vascular function.

The Section of Pulmonary Medicine directs a pulmonary laboratory that provides the full range of spirometry, blood gas and diffusing capacity analysis required to assess pulmonary physiology.

The clinical care units in University Hospital includes a 32 bed telemetry/step down unit and 26 intensive care beds that are utilized for medical, cardiac and cardiac surgical care.

The Omaha Veterans Administration Hospital is the second hospital utilized in the training program. It is a 300 bed referral hospital that provides a significant portion of the patients used in the fellow's training. All cardiac diagnostic services including electrocardiography, nuclear cardiology, electrophysiology and cardiac catheterization are available. Cardiac surgery services are not available at the Omaha VA. However, PTCA is being provided. CABG patients are transferred to Creighton or UNMC.

The outpatient service at University of Hospital is located on the second floor of the clinic

building. Cardiology will perform ECG's and exercise treadmill studies in the clinic, but the increased space should make it easier to accommodate the over 5,000 cardiology clinic visits that are made each year. The patients seen in the cardiology clinic include those with hypertension, peripheral vascular disease, coronary artery disease, adults with congenital heart disease, others with rheumatic and/or valvular heart disease and a number of electrophysiological problems such as syncope, bradycardia and tachycardia.

In addition to a general cardiology clinic where patients referred from other University physicians, surgeons or obstetricians/gynecologists are seen, we have a number of specialized clinics. These include a risk modification clinic, a clinic for patients with Marfan's Disease, arrhythmia clinics, a defibrillator clinic (to follow the over 180 devices implanted at UNMC) and clinics devoted to follow-up of permanent pacemakers.

While only inpatient cardiac rehabilitation is performed at University Hospital, the clinic is used to monitor patient's progress in their continued cardiac rehabilitation efforts and the clinic visits provide the clinician with the opportunity to write the patient's exercise prescription when changes are needed.

An important facet of the UNMC Cardiology training program is the close working relationship we have with the cardiothoracic surgery program. The University CT surgery programs serves as a referral center for a wide area and perform over 250 bypass operations and over 60 defibrillator implantations per year. The daily interdisciplinary cath conference utilizes this close working relationship to provide the patient with the best possible integrated care.

Clinical research is conducted at both the Veterans Administration and University Hospitals. After Institutional Review Board approval, patients are enrolled in only one of a number of ongoing multi center trials such as GUSTO, MUST, RESCUE and CABG-PATCH.

Basic science research is also conducted at both these institutions with the VA facilities being located in research building adjacent to the main VA Hospital. The research laboratories at the University are largely located in Swanson and South Halls on the UNMC campus. Animal Care and Use Facilities are located in the Eppley Science Hall and is overseen by an Institutional Animal Care and Use Committee.

Locations of Importance

The Cardiology Academic and Faculty offices are located in Room 6162 UH and 6126 UH (Telephone: 559-5151). The Diagnostic Cardiac Ultrasound and Noninvasive Diagnostics Faculty offices are located on the 2nd floor of the UMA 2567 (Telephone: 559-7977).

Non-invasive procedures are performed in the Heart Station which is located in the UMA Room 2450 (Telephone: 559-4143)

The majority of our inpatients are housed on 5 West (UNMC) (559-5430) , 7 North (552-3790), Adult Intensive Care Unit (AICD) 559-7000 and 7N (Clarkson) (552-3790), Clarkson (552-3800 & 552-3850).

Electrophysiological studies and cardiac catheterization procedures are conducted on the 4th floor of the Clarkson Hospital Room 4871 (Telephone: 559-3391)

Clinic patients are seen on the 2nd floor of the UMA building Room 2303 (Telephone: 559-8888).

Personnel

Chief of Cardiology; John R. Windle, MD (Office: ext 9-7524) (Pager: 1311)
Chief, VA Cardiology: Edward L. O'Leary, MD (Office: ext 9-4874) (Pager: 7822)

Transplant- CHF	**Office**	**Pager**
Ioana Dumitru, MD	559-7541	5768
Eugenia Raichlin, MD	559-5552	2273
Margie Chartrand, CHF Coordinator	559-8131	1765
Trish Fisher, CHF Coordinator	559-4479	1492
Melissa Christian, CHF Coordinator	559-8127	2512
Cardiac Catheterization:		
Edward L. O'Leary, MD	559-4874	7822
Scott W. Shurmur, MD	559-5974	2129
Keith R. Weeks, MD	559-8125	1062
Nattapong Sricharoen, MD	559-9269	0725
Ioana Dumitru, MD (VA only)	559-7541	5768
Faye Sorensen	559-7576	4755
Tom Denich, RN	552-2314	2941
Vicki Wilson	552-3391	4392
Tammie Hardersen	552-3391	4407

Echocardiography:	**Office**	**Pager**
Thomas R. Porter, MD, Director	559-8150	5189
Daniel Mathers, MD	559-8049	0871
Ward A. Chambers, MD	559-3595	5724
John Haas, MD	559-8657	348-4705
Tom Sears, MD	559-4224	5190
Ramin Artang, MD	TBD	TBD
Samer Sayyed, MD	TBD	TBD
Karin Gangahar, MD	559-5165	677-2884
Eric Williams, MD	TBD	3064
Electrophysiology:		
John R. Windle, MD	559-7524	1311
Arthur Easley, MD	559-8122	1063
Daniel Anderson, MD	559-8129	2751
Christopher Erickson, MD	559-3597	977-8851
John Scherschel, MD	559-8113	3408
Carol Henrich, APRN	559-3596	2481
Brian Stoneking, APRN	559-8525	1456
Anne Kowal, RN	559-3968	0940
Pacemaker Clinic:		
Terri Durham	559-8389	0308
Patty Ratigan	559-8389	1700
Administrator		
Cythnia Sutton, M.P.A.	559-8077	2529
Administrative Support		
Linda Cumbee, Program Associate	559-7172	
Jill Ramsdell, Fellowship Coordinator	559-9252	
Renee Cook, Accountant	559-8212	

Year in Program	Fellow	Completion Date	Office	Pager
1st Year	Thomas Deepak	June 30, 2013	559-6504	*TBD*
1st Year	Sunil Kumar	June 30, 2013	559-6504	*TBD*
1st Year	Hari Nallapaneni	June 30, 2013	559-6504	*TBD*
1st Year	Shikar Saxeena	June 30, 2013	559-6504	*TBD*
2nd Year	Kamran Akram	June 30, 2012	559-6504	1058
2nd Year	Nicholas Haglund	June 30, 2012	559-6504	1071
2nd Year	Michael Johnston	June 30, 2012	559-6504	2756
2nd Year	Rawa Sarji	June 30, 2012	559-6504	2620
3rd Year	Matt Baker	June 30, 2011	559-6504	0187
3rd Year	Saritha Dodla	June 30, 2011	559-6504	0195
3rd Year	Matt Johnson(Chief)	June 30, 2011	559-6504	2143
3rd Year	Matt McCormick	June 30, 2011	559-6504	0187
3rd Year	John Schmittner	Dec. 31, 2010	559-6504	3062
3rd Year	Taylor Dowsley	Oct. 31, 2011	559-6504	3370
Interventional	Jeremy Scott	June 30, 2011	559-6504	3059
Interventional	Syed Ahmed	Sept. 30, 2010	559-6504	3792

AN OVERVIEW OF THE CARDIOLOGY SERVICE

Admissions: Admissions can be emergent, urgent or elective for hemodynamic or EP and CHF service. All patients are to be worked up by one of the house staff. These patients can be either general ward, telemetry or AICU patients. It is expected that the H&P be dictated so that it is in the Phamis system.

Discharge: All discharges are to be done in a timely fashion. Discharge summaries are required by Medical Records and are usually done by the house staff. Care should be taken to plan the appropriate and correct follow-up, noting the condition at discharge. Referring physicians should receive copies of records. It is important that all the referring physicians copies, particularly the primary care physician.

Hospital Records: The hospital chart is a medical and legal document and allows for exchange of specific communication about the patient. We hope that your entries will be accurate, legible and respectful of the rights and privacy of the patient and other medical personnel. Carefully documented medical need for hospitalization will help to avoid difficulty with utilization review. In the same regard, do not indicate that the patient is ready for discharge until the day he/she actually leaves.

On-Call Responsibilities: The Chief Fellow will put together the Fellows' and residents on-call schedule and will assign individual fellows to cover the holidays. Weekday call usually begins at 5:00 p.m. until the following day at 8:00 a.m. Weekend call also begins at 5:00 p.m. until the following Monday at 8:00 a.m. Patient admissions, consults, procedures and problems are the responsibility of the on-call individual. A copy of the on-call schedule is forwarded to the scheduling coordinator two weeks prior to the start of any given period of call. All changes to be reported through the Chief Fellow and/or coordinator. Requests for time off for vacation, education and sick leave should b made through the fellowship coordinator. Any other requests not to take call should be made directly to the Chief Fellow.

Phone Calls after Hours: In general, calls go to the resident assigned to the Service first. The physician on call for the EP service is listed on the monthly call schedule. Of course, any call from a patient or referring physician should be handled promptly.

Emergency Patient Transfers to Cath Lab during Nights, Weekends and Holidays:
Only invasive call attending can accept patient transfers to the cath lab, and only invasive call attending/ER staff can summon the cath lab on-call staff for preparation for the procedure, therefore:

I. Faculty members are directly responsible for consulting with invasive call attending before

transferring their patients to the cath lab for emergency procedures. This consultation should not be delegated to residents, fellows other personnel.

II. Cath lab on-call staff should come to the lab and start preparations only after they have been called in the invasive call attending. Invasive call attending may ask the on-call fellow or the hospital operator to place these calls in order to save time.

CONFERENCES AND LECTURES

There are three Conference and Lecture series available to Cardiology Fellows, Internal Medicine Residents, and Medical Students rotation on the Cardiology service. Each Cardiology Fellow is expected to attend certain conferences on a regular basis; absences will be excuse only for emergent, **vacation or education leave** (prior approved requests or unforeseen circumstances) reasons. Excessive absences will be followed-up by the Chief Fellow and Section Chief. Attendance will be taken. Attendance will be used as one factor in your overall evaluation in the fellowship **and is required by the American Board of Internal Medicine and the ACGME.**

Morning Report is held on **Clarkson 7North** at 9 a.m. Check-out rounds to be completed by 5 p.m. (**Meeting on Clarkson 7North**)

EP Staff Conference: Monday thru Friday, 8 a.m., 6th floor in Room 6614 (Fellows, Residents and Students assigned to Electrophysiology only)

Cardiology Grand Rounds Series
(Tuesdays of each month, 7 AM, MSC 2014)

Invited speakers, on the off campus, give presentations to the Students, Fellows and Faculty. Every week will be a new topic such as journal club, quality initiative, complex decision making.

Series includes:
Cardiology Journal Club
(Second Tuesday of each month, 7:00AM, MSC 2014)

Cardiac Imaging Conference Series
(1st three Wednesdays of the month at 7 AM, MSC 2014)

Series includes:
Combined Echo Conference
(Alternates 4th Wednesday at 7 AM,
MSC 2014 or Creighton Cardiac Center, 3006 Webster)

The format for each case is presentation of a brief history and physical of a patient with an interesting echo during the month. This is followed by a presentation of the echocardiogram. Each participating group (Adult Cardiology at Creighton and UNMC as well as the Pediatric Cardiology group) should bring one or two echos. The Cardiology fellow is required to present cases at the combined Adult/ Pediatric echo conference for the following month of their rotation. The pertinent findings of each echo should be outlined.

Interventional Conference
(Every Thursday at 7AM, MSC2014)

These conferences cover a core curriculum and are given by cardiology faculty, other UNMC faculty and guest faculty from other institutions.

EP Curriculum Conference
(Every Friday at 7 AM, MSC2014)

The EP conference introduces electrophysiology principles to advanced fellows. Provide fellows with the opportunity to ask specific questions and observe fellows presenting of case material and understanding of concepts and principles.

ECG Conference (check scheduling)
(Every Monday at 7:00 AM, MSC2014)

Nuclear Reading Conference (check scheduling)
(Every Monday and Thursday at 5:00 PM, MSC2014)

DIVISION POLICIES

Vacation/Sick Leave
Each fellow receives 20 week days and 8 adjacent weekends for vacation during the academic year. Extra days are carried over to the next year (no weekend are carried over) Up to 30 days of leave not taken will be paid to you upon completion of training. Each Fellow is allowed 5 days for educational leave or meeting time in addition to the time scheduled for vacation. Absence reports must be completed and submitted to the Chief Fellow and Jill Ramsdell for approval no less than one month prior to the vacation or meeting and **is required by the ABIM.**

> **Exception**: All June vacations must be submitted by the first week of May. Final paperwork in the Internal Medicine Education Office needs to be completed for the academic year.
>
> **Important**: Until requests for vacation/education are approved and signed by the Section Chief, do not make plans which cannot be altered.

Time requested off will be granted on a first-come, first-serve basis. Please send your vacation/educational leave request first to Joanie Martin for a signature from Dr. O'Leary and then for the Section Chief's signature. If absence forms are not received prior to vacation/meeting time, it is up to the discretion of the Education Committee as to if this person will be paid for that duration of time.

Requests for time off while on (**UNMC primary care service and CHF rotation**) are strongly discouraged. If you find it necessary to request time off while on a these services, you must be arrange coverage for your absence. **This must be noted on the absence request at the time it is submitted.** It is your responsibility to inform the faculty/clinic which you are assigned, that you will not be available at either or both UNMC and VA Hospital clinics.

Sick Leave In the case of illness, fellows must contact BOTH the Chief Fellow and the Fellowship Coordinator by 7:00 AM. An absence form MUST be submitted within two days of returning to work.

Maternity/Paternity Leave: Contact the Education Office for more details. As with vacation and education requests, maternity or paternity leave required approval of the Section Chief. UNMC participates in the Family Medical Leave Act.

Request to Travel: If you will be submitting a poster presentation, abstracts, etc. at a meeting, the University has very strict guidelines for any travel which requires time off from your normal duties. This includes travel to and from education meetings. Please see Joanie Martin for any travel arrangements to be made. A travel authorization is important because it allows you to be reimbursed upon your return, but more importantly, it provides liability coverage in the case

of an accident. A travel authorization form must be completed even if there is no expense to the University.

Upon your return, an employee expense voucher is completed (keep all receipts to ensure maximum reimbursement). This form will generate a reimbursement check. The University will not reimburse for movies, personal phone calls or car rentals.

Moonlighting: To moonlight at Veteran's Administration Medical Center, a form can be obtained from the Medical Staff Office at Veteran's Administration Medical Center. This must be filled out and approved by there designated committee to appoint temporary duty physicians.

For any moonlighting job a locum tenens form must be completed by the fellow, signed by the Fellowship Director and forwarded to GME. The fellow will receive one copy back for their records and the section will receive another copy to be kept in their file forever. UNMC moonlighting policy is covered in your contract.

Malpractice Insurance at UNMC: This item is covered in your current contract.

MISCELLANEOUS

Blackboard Courses: This is a requirement that must be completed the first year of your fellowship training. We will not be able to certify your graduation from our program if these sections are not completed in a timely manner. If you have questions you may contact Dr. Edward O'Leary or Linda Cumbee.

Evaluations: Each fellow will be evaluated by their attending(s) at the end of each month. In addition, each fellow is required by the ACGME to complete an evaluation on the rotation and attending physicians at the end of each month. Evaluations are submitted on-line on the New Innovations Program. The fellowship coordinator can assist you.

Procedure Logs: Procedure logs are now entered in the New Innovations Residency Management Program. It is expected that you enter your procedures on a **daily basis**. Once a procedure log is entered, attending faculty will receive email notification of the procedure so they can electronically confirm it. Please contact the fellowship coordinator with questions.

Duty Hour Logs: This is a requirement that must be completed on a timely basis or you will be subjected to disciplinary action. Duty hours are now entered on New Innovations Program. The fellowship coordinator can assist you.

Textbook Money: The Graduate Medical Education office provides a $100 stipend to use toward the purchase of textbooks - you must use it for textbooks and not supplies. In

addition, the Section of Cardiology provides $200 for the same purpose, for a total of $300 in book money. You may order from the UNMC Bookstore or off-campus. Please see Renee Cook, Section Accountant, for specific directions before you make a purchase. You will need to have her prior approval and a purchase order form.

Mail Boxes: The fellow's mailboxes are located in the front reception area of the Cardiology Administrative Offices (UH 6162). Fellows should check their boxes frequently for messages, notices and mail. Our internal campus zip code is: 2265.

Lab Coats: Each new fellow is supplied with four lab coats, if coming from outside institution. If you're a current resident transferring as a fellow you will only receive two lab coats. You will receive a purchase requisition from Vicki Hamm (Graduate Medical Education) during orientation. The coats can be picked up from the Bookstore with the requisition form. The Section will arrange to have the coats embroidered with your name. The coats will be laundered by Fashion Cleaners every Wednesday and returned if you drop them in the basket located in the restroom inside the Cardiology Administrative Offices (UH6162). Make sure your coats are embroidered with your name and department (Cardiology Fellow) before placing them in the basket. Please see Brenda Martin for information regarding the laundering process.

Pagers: The Section of Cardiology provides each Fellow with a pager. Pages should be answered in a timely manner. It is the Fellow's responsibility to replace a lost/stolen pager.

E-mail: Fellows are encouraged to check their email daily. If you prefer to use a different e-mail address please notify the Fellowship Coordinator.

UNMC pagers: dial 888, + 4 digit number, + call back number
UNMC pagers off campus: dial 888, + 4 digit pager number, then our call back number.

Counseling Services

Counseling, assessment, referral and psychological support are available free of charge through the UNMC Faculty/Employee Assistance Program (FEAP) and Student Counseling Center. For information or to schedule a confidential appointment, faculty/employees should call FEAP at 559-5323 or 559-5175. Students and residents seeking assistance should call the Student Counseling Center at 559-7276.

CHEMICAL DEPENDENCY POLICY

It is the position of the University of Nebraska Medical Center (UNMC) that chemical dependency is a disease that can endanger the health and well-being of students, employees and faculty and can have a negative effect on the public they serve. UNMC advocated treatment and rehabilitation for affected students, employees, and faculty in a manner that first protects that public, while allowing reasonable opportunity for recovery and re-entry into the workplace/classroom. Chemical dependency is recognized as a disease and employee relations issues will be administered from this philosophy and in accordance with all legal requirements of state and federal law.

UNMC does not illegally discriminate in its academic program or employment practices against individuals who are in recovery from chemical dependency. UNMC takes a community leadership role in healthcare professional education, research and public education about substance use, abuse and dependency.

PROCEDURES

1. Students, employees and faculty who recognize a problem relate to their alcohol and drug use may voluntarily seek confidential assistance through student counseling services or the faculty/employee assistance program (FEAP). Exceptions to confidentiality may include situations where there is a suspicion of danger to self or others.

2. Students, employees and faculty identified for mandatory referral to the FEAP or student counseling shall be those who demonstrate the following behaviors that are found to be related to alcohol or other drug use:

    A. A pattern of poor job or academic performance
    B. Disciplinary problems such as absenteeism and tardiness
    C. Violations of the law that impact job performance
    D. Diversion of controlled substances
    E. Others acts which violate the UNMC substance abuse policy (standards of conduct for employees and students regarding alcohol and drugs)

3. When a student, employee or faculty member is aware of behavior that is considered with impairment as outlines in procedure 2 above, that individual shall immediately report this behavior to an appropriate supervisor. Concerns regarding student behaviors outline in paragraph 2 above shell be reported immediately to an appropriate faculty or college administrator who is designated by the dean. Questions about the appropriate course o action should be directed to student counseling or FEAP.

4. STUDENT PROCEDURES FOR MANDATORY REFERRAL

A. Each college dean will designate an administrator or faculty member to coordinate the student's referral to student counseling for chemical dependency assessment, treatment, and aftercare. The dean's designee will monitor the student's progress with respect to fitness to continue in the academic program, and may require the student to enter into contract agreements.

B. When a UNMC official (dean, department head, faculty and others who supervise students) have evidence of behaviors that impair academic or clinical performance listed in procedure 2, he or she should:
    1. Document performance or behaviors
    2. Report behaviors to the dean's designee, who will then confront the student regarding the observed behavior
    3. The dean's designee will make a mandatory referral of such students to UNMC student counseling center for a required chemical dependency assessment. The student counseling staff will report the results of the initial assessment to the designated official in the respective college of academic department. Student counseling will make referrals to other treatment agencies when further chemical dependency evaluation and treatment are indicated.

C. When a student is suspected of diversion or intoxication or is posing an immediate danger to himself, herself or others, the dean's designee will follow the procedures outlined:
    1. Remove the student from the academic or clinical setting as discreetly as possible. Security officers may be called if needed.
    2. Inform the student of the behaviors observed and that he or she will not be allow to remain on the premises, due to these behaviors.
    3. Escort the student to student health for appropriate evaluation and testing and informed the physician on duty of the behaviors exhibited by the student that led others to believe he or she was impaired.
    4. Refusal to comply with official request should snot attempt to prevent the student from leaving the premises if the student insists on doing so. In such cases, college officials will document that option a. and b. were offered and that the student refused these options.

       In most circumstance that college official should not attempt to prevent the student from leaving the premises if the student insists on doing so. In such cases, college officials will document that option a. and b. were offered and that the student refused these options.

D. When a UNMC official other than the dean's designee is involved in managing an emergency situation outlined in 4.c. 1-4, he or she should document that

incident and actions taken and forward this information to the dean's designee as soon as possible.

E. Faculty and administrative seeking information on mandatory student referrals should contact student counseling or the college dean's office.

EMPLOYEE AND FACULTY PROCEDURES FOR MANDATORY REFERRAL

F. When a manager/supervisor identifies and employee or faculty member to be impaired so that he or she is incapable of performing the requirements of the job adequately or safely, the manager/supervisor will follow the guidelines below. These observations may include but are not limited to the smell of alcohol or other substance on the breath or clothing, erratic or unusual behaviors, and/or deterioration of physical appearance.
    1. Document the performance or behaviors in specific terms.
    2. Confront the employee regarding documented behaviors.
    3. Make a mandatory referral of such employee or faculty member to the FEAP for a required mental health/chemical dependency screening.
    4. FEAP will report the assessment of the employee's fitness for duty, or their recommendation for further treatment and/or the need for assessment, treatment, or recovery contracts to the manager/supervisor.

G. When the employee or faculty member is suspected of diversion suspected of intoxication or is posing an immediate danger to self or others, the manager/supervisor will follow the guidelines below:
    1. Remove the employee or faculty member from the work area as discreetly as possible.
    2. Inform the employee or faculty member of the following:
        a. The observed behavior
        b. Due to the observed behavior, he or she will not be allowed to work
        c. Refusal to comply with the manager/supervisor's requests may result in corrective action up to and including termination
        d. A written report documenting this incident will be completed
    3. Escort the employee or faculty member to the center for occupational and environmental health (emergency department after hours). The manger/supervisor will inform the physician on duty of the behaviors or is the employee exhibits behavior dangerous to self or others.

In most circumstances these supervisor or any other personnel should not attempt to prevent the employees from leaving the premises if the employee or faculty member insists on doing so. In such cases, it is imperative that the supervisor document on the corrective action report that the employee was offered options a. and b. and the employee refused these options.

5. Students, faculty and employees who are of mandatory referral status due to chemical impairment will be required to sign written contracts stating the terms of assessment, treatment and recovery. Individuals of mandatory referral status who refuse to comply with contract requirements may be subject further disciplinary action up to and including dismissal. When applicable, a report to the State Department of Health, Bureau of Examining Boards, will be furnished.
6. Existing UNMC policies governing leave of absence for illness will be applied to those students, employees and faculty who may need time off for evaluation or treatment of chemical dependency.
7. Responsibility for any costs of evaluation, treatment or aftercare shall be borne by the individual. Random testing will be paid from an established central fund. Some cost may be covered by health insurance.
8. Re-entry into the workplace/classroom following an absence for chemical dependency treatment or continuation of work/academic program during treatment will be coordinated by the FEAP or student counseling case manager. A re-entry agreement may place restrictions on the individual's work, classroom, laboratory, clinical or clerkship activities that are thought to be in the best interest of the individuals recovery public safety.
9. Student, faculty or employee participation in respective student counseling or FEAP recovery programs is a condition of continued employment or academic progress at UNMC. By law, individuals may still be subject to criminal prosecution or licensure actions.
10. Relapse episodes will be treated similarly to initial impairment. When it becomes evident that the individual is in relapse, he or she will be subject to further evaluation, treatment aftercare agreements. Episodes of relapse may be cause for disciplinary action which may include termination.
11. The departments of student and employee health have the responsibility for establishing urine and/or blood screening protocols for alcohol and/or drugs, and for coordinating reporting procedures.
12. In compliance with federal confidentiality regulations, all records of students, faculty and employee involvement with student counseling or FEAP are kept confidential. Such records will be kept in the offices of student counseling, FEAP and/or employee health and will not become a part of the permanent student or employment record. Information from these records will be released only with the individual's written consent or as required by law. With a signed release, student counseling and FEAP will provide progress reports to college administrators or supervisors that are limited to the individual's compliance, the progress in rehabilitation and recommendations for returning to work or school.

13. DIVERSION

A. Diversion shall be defined as the theft of a controlled substance from any UNMC facility, including off-campus sites.
    1. Diversion for own use: When students, employees or faculty members are determined to have diverted drugs from a UNMC facility for their own use, they will be subject to immediate disciplinary action. Such disciplinary action will include a mandatory referral to student counseling or FEAP for chemical dependency/mental health assessment and recommendations.
    2. Diversion for use by others. Diversion for use by others or for resale will subject the individual to immediate disciplinary action under UNMC policies.
        B. Refusal to participate in evaluations, treatment and recovery agreements shall be cause for further disciplinary action up to and including dismissal.
        C. Except for circumstance described in section D. below, an individual who has been determined to be chemically dependent and has diverted the drugs for personal use may not face immediate termination/dismissal but will be required to enter into a treatment or recovery agreement with student counseling or FEAP, and satisfactorily complete the terms of this agreement. In any case, UNMC is required by law to follow drug enforcement agency and Department of Health reporting procedures governing loss of controlled substances.
        D. When a known harm occurs to other from an individual's diversion of controlled substances, that individual shall face disciplinary action up to and including dismissal and the appropriate licensing board will be notified.
        E. This policy is intended to be consistent will all other UNMC policies governing controlled substances.

14. MONITORING

Under the following circumstances, students, employees and faculty members who are chemically dependent may be required to enter into a recover contract. The terms of the contract may include drug screens, restrictions on clinical activities and/or close supervision.

A. When a situation occurs such as described on page 1 of this policy under procedures 2.
B. They have transferred from an institution where they were under a recover contract.
C. Their licensure or certification is currently restricted and/or they are on probation and /or they are participating in a state-authorized recover

program with the Department of Health, Bureau of Examining Boards of the State of Nebraska or any other state.

D. If a prospective employee has less than two year of sobriety, he or she may be subject to assessment by student counseling or FEAP. The need for contracting will be determined on a case by case basis.

Evaluation Process by Fellows

All cardiology fellows are required to complete monthly evaluations on attending faculty. This will be done on the New Innovations Program. Fellows evaluations of faculty will remain anonymous.

ABIM Leave of Absence

According to the ABIM policy, please be aware that if your total leave is more than 20 days per training year, your fellowship training will have to be extended. If you have any questions or concerns, please contact the Program Director.

Leave of Absence

The house officers shall have four weeks (twenty working days) of paid vacation per year provided that such vacation days shall not include more than eight weekends. Vacation for house officers employed less than one year will be pro-rated. Up to a maximum of thirty unused vacation days may be carried over and used by the house officer in the succeeding year. House officers employed one year or more shall be reimbursed for up to thirty working days of unused vacation time upon termination of employment. House officers may have up to five days of leave with pay for approved professional or educational meetings.

Professional meetings and vacation days must be scheduled to assure coverage in accordance with minimum staffing standards of the service to which the house officer is assigned. Vacation and meeting days shall be scheduled by delivering a notice in writing at least 30 days in advance of the beginning of the scheduled rotation to both the house officer's own program and the service which the individual is assigned and from which leave is to be taken. Conflicts in scheduling of meetings or vacation days shall be resolved by the Program Director.

In some circumstances, the amount of allowable leave my exceed the amount allowed by the program and by the specialty board to receive credit for a full year of training. Thus, the total time taken as leave of absence permitted under this contract may require that a house officer extend their training program to meet the program requirements.

Fellows Duty Hours and the Working Environment

Providing fellows with a sound academic and clinical education must be carefully planned and balanced with concerns for patient safety and fellow well-being. Each program must ensure that the learning objectives of the program are not compromised by excessive reliance on fellows to fulfill service obligations. Didactic and clinical education must have priority in the allotment of fellows' time and energies. Duty hour's assignments must recognize that faculty and fellows collectively have responsibility for the safety and welfare of patients.

Supervision of Residents

1. All patient care must be supervised by qualified faculty. The program director must ensure, direct, and document adequate supervision of fellows at all times. Fellows must be provided with rapid, reliable systems for communicating with supervising faculty.

2. Faculty schedules must be structured to provide residents with continuous supervision and consultation.

3. Faculty and residents must be educated to recognize the signs of fatigue and adopt and apply policies to prevent and counteract the potential negative effects.

Duty Hours

1. Duty hours are defined as all clinical and academic activities related to the fellowship program, i.e., patient care (both inpatients and outpatient), administrative duties related to patient care, the provision for transfer of patient care, time spent in-house during call activities, and scheduled academic activities such as conferences. Duty hours do not include reading and preparation time spent away from the duty site.

2. Duty hours must be limited to 80 hours per week, averaged over a four-week period, inclusive of all in-house call activities.

3. Fellows must be provided with 1 day in 7 free from all educational and clinical responsibilities, averaged over a 4-week period, inclusive of call. One day is defined as one continuous 24-hour period free from all clinical, educational, and administrative activities.

4. Adequate time for rest and personal activities must be provided. This should consist of a 10 hour time period provided between all daily duty periods and after in-house call.

On-Call Activities

The objective on on-call activities is to provide fellows with continuity of patient care experiences throughout a 24-hour period. In-house call is defined as those duty hours beyond the normal work day when fellow are required to immediately available in the assigned institution.

1. In-house call must occur no more frequently than every third night, averaged over a four-week period.

2. Continuous on-site duty, including in-house call, must not exceed 24 consecutive hours. Fellows may remain on duty up to 6 additional hours to participate in didactic activities, transfer care of patients, conduct outpatient clinics, and maintain continuity of medial and surgical care as defined in Specialty and Subspecialty Program Requirements.

3. No new patients, as defined in Specialty and Subspecialty Program Requirements, may be accepted after 24hours of continuous day.

4. At-home call (pager call) is defined as call taken from outside the assigned institution.
    a. The frequency of at-home call is not subject to the every third night limitation. However, at-home call must not be so frequent as to preclude rest and reasonable personal time for each resident. Resident taking at-home call must be provided with 1 day in 7 completely free from all educational and clinical responsibilities, averaged over a 4-week period.
    b. When fellows are called into the hospital from home, the hours fellows spend in-house are counted toward the 80 hour limit.
    c. The program director and the faculty must monitor the demands of at-home call in their programs and make scheduling adjustments as necessary to mitigate excessive service demands and/or fatigue.

Moonlighting

1. Because fellowship education is a full-time endeavor, the program director must ensure that moonlighting does not interfere with the ability of the fellow to achieve the goals and objectives of the educational program.

2. The program director must comply with the sponsoring institution's written policies and procedures regarding moonlighting, in compliance with the Institutional Requirements.

3. Moonlighting that occurs within the fellowship program and/or the sponsoring institution or the non-hospital sponsor's primary clinical site(s), i.e., internal moonlighting, must be counted toward the 80-hour weekly limit on duty hours.

4. There will be no moonlighting overnight prior to the work day.

CURRICULUM

Echocardiography

Fellow Responsibilities during the Echocardiography Rotation

1. Fulfill requirement for each monthly rotation as described in the curriculum.

2. Perform two-dimensional echocardiographic scanning at least 3 studies per day, with scanning time limitation of 15 minutes/study. If the study cannot be completed within 15 minutes, echocardiographic technicians will complete the study.

3. Learn the technical skills required to perform the exam, including:

    a. Understanding the instrumentation
    b. Optimizing image quality (color Doppler and two-dimension)

4. Interpret transthoracic echocardiography independently and review the result with echocardiographic staff physician assigned to read echocardiogram that day.

5. Participate in dobutamine/exercise stress test with attempt to interpret result independently.

6. Help to communicate and triage patients if asked to do so.

7. To qualify for performing transesophageal echocardiographic procedure, fellows must complete scanning and interpreting 150 transthoracic echocardiographic studies.

8. The cardiology fellow is required to present cases at the combined Adult/Pediatric echo conference for the following month of their echo rotation.

University Nebraska Medical Center
Cardiovascular Fellowship

Echocardiography Program Curriculum

Month 1: All cardiology fellows must be adequately trained and are able to achieve in the cognitive skill needed to perform echocardiography as following:

1.Appropriate indications for echocardiography
2.Knowledge of normal cardiac anatomy
3.Alternative diagnostic techniques
4.Ability to communicate the results of examination to the patient, medical record and other physicians

All cardiology fellows must be able to achieve technical skill needed to perform and overread with the attending of 50 examinations.

The Cardiology fellow is required to present cases at the combined Adult/Pediatric echo conference for the following month of their echo rotation. The pertinent findings of each echo should be outlined.

Month 2: All cardiology fellows must be adequately trained and are able to achieve in the cognitive skill needed to perform echocardiography as following:

1. Knowledge of physical principles involved in obtaining 2D and Doppler echocardiographic display
2. Knowledge of fluid dynamics of normal blood flow
3. Knowledge of cardiac auscultation and ECG for correlation with results of echocardiogram
4. Ability to distinguish an adequate from and inadequate examinations

All cardiology fellows must perform and overread with the attending for a minimum of 50 examinations.

The Cardiology fellow is required to present cases at the combined Adult/Pediatric echo conference for the following month of their echo rotation. The pertinent findings of each echo should be outlined.

Month 3: All cardiology fellows must be adequately trained and are able to achieve in the cognitive skill needed to perform echocardiography as following:

1. Appropriate echocardiographic techniques required to answer of differential diagnosis

2. Knowledge of pathologic changes in cardiac anatomy due to acquired and congenital heart disease
3. Knowledge of pathologic changes in cardiac blood flow in acquired and congenital heart disease
4. Knowledge of basic principles of tissue Doppler imaging and color M mode

All cardiology fellows must be able to achieve technical skill needed to perform and overread with the attending for 50 examinations, including cases involving aortic stenosis, prosthetic valves, and mitral valve disease.

The Cardiology fellow is required to present cases at the combined Adult/Pediatric echo conference for the following month of their echo rotation. The pertinent findings of each echo should be outlined.

Month 4: All cardiology fellows must be able to achieve in the all cognitive skill needed to perform echocardiography and ability to perform and interpret tissue Doppler imaging and color M-mode

All cardiology fellows must be able to achieve technical skill needed to perform and overread with the attending for 50 examinations.

The Cardiology fellow is required to present cases at the combined Adult/Pediatric echo conference for the following month of their echo rotation. The pertinent findings of each echo should be outlined.

Month 5: All cardiology fellows should be able to achieve in basic knowledge in

1. Appropriate indications for stress echocardiography
2. Alternative diagnostic techniques for stress echocardiography
3. Knowledge of basic principles of stress echocardiography

Fellow must demonstrate the ability to perform and interpret adult congenital heart disease.
The Cardiology fellow is required to present cases at the combined Adult/Pediatric echo conference for the following month of their echo rotation. The pertinent findings of each echo should be outlined.

All cardiology fellows must be able to achieve technical skill needed to perform and overread with the attending for 50 examinations.

Month 6: All cardiology fellows should be able to achieve in basic knowledge in

1. Appropriate indications for transesophageal echocardiography

2. Alternative diagnostic techniques for transesophageal echocardiography
3. Knowledge of basic principle of transesophageal echocardiography
4. Knowledge of normal transesophageal echocardiography views

The Cardiology fellow is required to present cases at the combined Adult/Pediatric echo conference for the following month of their echo rotation. The pertinent findings of each echo should be outlined.

All cardiology fellows must be able to achieve technical skill needed to perform and overread with the attending for 50 examinations.

Month 7: All cardiology fellows should be able to achieve in

1. Knowledge of how to select an appropriate type of stress echocardiography
2. Knowledge of hemodynamic and coronary blood flow in ischemic heart disease
3. Appropriate technique to perform transesophageal echocardiography
4. Ability to identify pathologic change in cardiac anatomy due to acquired and congenital heart disease by transesophageal echocardiographic views
5. Basic principles of echocardiographic research

The Cardiology fellow is required to present cases at the combined Adult/Pediatric echo conference for the following month of their echo rotation. The pertinent findings of each echo should be outlined.

All cardiology fellows must be able to achieve technical skill needed to perform and overread with the attending for 75 examinations, 15 stress echocardiograms, and 10 supervised esophageal intubations.

Month 8: All cardiology fellows should be able to achieve in

1. Knowledge of how to improve echocardiographic image quality in technical difficulty examinations
2. Knowledge of basic principles of contrast echocardiography
3. Knowledge and management of complications from stress echocardiography
4. Knowledge and management of complications from transesophageal echocardiography
5. Involve in echocardiographic research

All cardiology fellows must be able to achieve technical skill needed to perform and overread with the attending for 75 examinations, 15 stress echocardiograms, and 15 supervised esophageal intubations.

The Cardiology fellow is required to present cases at the combined Adult/Pediatric echo conference for the following month of their echo rotation. The pertinent findings of each echo should be outlined.

Month 9: All cardiology fellows should be able to achieve in

1. Knowledge of appropriate technique to perform contrast echocardiography including coronary physiology
2. Knowledge of basic principles of intra operative transesophageal echocardiography
3. Continue to be involve in echocardiographic research with more active role

The Cardiology fellow is required to present cases at the combined Adult/Pediatric echo conference for the following month of their echo rotation. The pertinent findings of each echo should be outlined.

All cardiology fellows must be able to achieve technical skill needed to perform and overread with the attending for 75 examinations, 15 stress echocardiograms, and 15 supervised transesophageal studies.

Month 10: All cardiology fellows should be able to achieve in

1. Appropriate technique to perform contrast echocardiography, and demonstrate adequate knowledge of coronary physiology in coronary atherosclerosis and how this is detected with contrast echo.
2. Knowledge of basic principles of intra operative transesophageal echocardiography
3. Continue echocardiographic research with providing initiative idea and input

The Cardiology fellow is required to present cases at the combined Adult/Pediatric echo conference for the following month of their echo rotation. The pertinent findings of each echo should be outlined.

All cardiology fellows must be able to achieve technical skill needed to perform and overread with the attending for 75 examinations, 15 stress echocardiograms, and 15 supervised transesophageal studies, and 15 supervised stress myocardial perfusion studies with intravenous microbubbles.

Month 11: All cardiology fellows should be able to achieve in

1. Knowledge of basic principle of three-dimensional echocardiography
2. Knowledge of basic principle of power Doppler echocardiography
3. Knowledge of basic principle of color kinesis
4. Continue to be involved in echocardiographic research and transform data into abstracts
5. Exposure to administrative aspects of running an echocardiographic laboratory

The Cardiology fellow is required to present cases at the combined Adult/Pediatric echo conference for the following month of their echo rotation. The pertinent findings of each echo should be outlined.

All cardiology fellows must be able to achieve technical skill needed to perform and overread with the attending for 75 examinations, 20 stress echocardiograms, and 15 supervised transesophageal studies, and 15 supervised stress myocardial perfusion studies with intravenous microbubbles.

Month 12: All cardiology fellows should be able to achieve in

1. Knowledge of setting up and running and echocardiographic laboratory
2. Continue to be involved in echocardiographic research and present result from the research in from of lecture, grand round, symposium and scientific session of local or national meetings

The Cardiology fellow is required to present cases at the combined Adult/Pediatric echo conference for the following month of their echo rotation. The pertinent findings of each echo should be outlined.

All cardiology fellows must be able to achieve technical skill needed to perform and overread with the attending for 75 examinations, 20 stress echocardiograms, and 20 supervised transesophageal studies, and 15 supervised stress myocardial perfusion studies with intravenous microbubbles.

University of Nebraska Medical Center
Cardiovascular Fellowship

Program Requirements
Echocardiography

I. Level 1

1. 3 Months
2. Minimum of 150 examinations (M-mode, 2D Echo and Doppler)
3. Examines and personally perform at least 75 of these studies.

II. Level 2 (Interprets echos independently)

1. 3 additional months (6 months total)
2. 150 additional examinations (300 exams)
3. Examines and personally perform at least 75 of these studies.

III. Level 3 (Director of Echo Lab)

1. 6 additional months (12 months total)
2. 450 additional examinations (750 exams total)
3. Including performance of an additional 150 studies.

IV. Transesophageal Echocardiography

1. Completion of Level 2 training
2. Minimum of 25 esophageal intubations
3. Minimum of 50 supervised TEE studies

V. Exercise Stress Echocardiograms

1. Completion of Level 2 training
2. Minimum of 100 supervised interpretations

University Nebraska Medical Center
Cardiovascular Fellowship

Electrophysiology

Program Requirements

I. Electrophysiology studies

1. Level 1 (Requires supervision)
   a. 3 months EP rotation

2. Level 2 (Independent operator)
   a. 1 Year EP fellow dedicated

II. Pacemakers (temporary)

1. Level 2 (Independent operator)
   a. 3 months EP

III. Pacemakers (permanent)

1. Level 2 (Independent operator)
   a. 30 procedures (at least 20 as primary operator*) or
   b. 1 Year EP fellow

III. Tilt Table Testing

1. Level 2 (Independent operator)
   a. 3 months EP

IV. Cardioversion

1. Level 2 (Independent operator)
   a. 3 months EP

V. Electrocardiology

1. Level 2 (Independent operator)
   a. 2 yrs fellowship

Training Guidelines and Curriculum for Electrophysiology Service

(Dedicated EP Fellowship)

Duration:
The dedicated electrophysiology rotation for Board Certification for Electrophysiology Boards will be a duration of one year. It will be offered only to candidates who are board eligible in cardiology.

Goal:
To master the basic and clinical cardiac electrophysiology so that the resident/fellow is competent/expert to independently perform the gamut of electrophysiologic decision-making and procedures as defined by the ACGME, ABIM, ACC/AHA and NASPE guidelines.

Learning Objectives:

1. To develop expertise and mastery of diagnosis and treatment (including technical expertise) of the following conditions:
    a. Paroxysmal, Persistent, Permanent and peri-operative atrial fibrillation and flutter.
    b. Paroxysmal supraventricular tachycardia
    c. Bradycardia and indications for pacing
    d. Syncope
    e. Ventricular Tachycardia/Fibrillation
    f. Sudden Cardiac Arrest assessment and prevention.

2. To develop a mastery of the technical components of the electrophysiology laboratory including stimulators, computerized recording systems, catheters, lesion generators and electrical interference.

3. To develop expertise in the diagnosis of complex arrhythmia through pacing and intracardiac recordings and 3-D mapping.

4. To develop competency in the performance of electrophysiologic studies including catheter manipulation, transseptal catheterization techniques and manipulation of ablation catheters.

5. To develop technical expertise in the implantation, testing and programming of pacemakers and defibrillators.

6. To understand the business principles of the arrhythmia practice including ethics, coding, billing and documentation.

Training Guidelines and Curriculum for Electrophysiology Service

(During Cardiology Fellowship)

Duration:

The electrophysiology rotation is comprised of three one-month rotations. Two are required by the ACGME. More time on the service may be deemed necessary for the individual trainee if specific deficiencies are observed in the evaluation process.

Goals:

The goals of the electrophysiology rotations are to develop mastery of inpatient and outpatient management of atrial and ventricular arrhythmia. In addition, the fellows should have an excellent knowledge of arrhythmic diagnoses and treatment including:

A. Paroxysmal, persistent, permanent and peri-operative atrial fibrillation
B. Syncope
C. Bradycardia
D. Paroxysmal supraventricular tachycardia
E. Ventricular tachycardia
F. Sudden cardiac death assessment and prevention

Learning Objectives:

1. Learn the normal and abnormal pathophysiology of the cardiac conduction system and mechanisms of arrhythmogenesis.
2. Antiarrhythmic Drug Therapy:
    a. Learn the pharmacology of antiarrhythmic drugs.
    b. Learn the mechanisms of antiarrhythmic drugs on the heart.
    c. Learn the side effects of antiarrhythmic drug therapy.
3. Learn the interpretation of electrocardiograms and holter monitoring in conjunction with the ECG conference.
4. Learn the electrophysiologic correlates of simple and complex atrial and ventricular arrhythmia.
5. Learn the approaches to the evaluation and treatment of patients with various arrhythmia and their clinical presentations.
6. Obtain exposure to the indications, types and follow-up of pacemakers and defibrillators.
7. Introduction to the performance of electrophysiology studies and the interpretation of the data.
8. Learn pacemaker and ICD evaluation and interrogation.

Description of Rotation:

The Electrophysiology service covers patients at NHS and VAMC, and, by its nature, covers both inpatient and outpatient services. Due to the changes in medical care, there has been a shift of a large portion of the care of patients with arrhythmia to the outpatient settings. The service generally consists of an attending, a fellow (when assigned), a second or third year resident when assigned, and medical students. The service also has two nurse practitioners, as well as a dedicated pacemaker staff. Patients are admitted primarily to the service from outpatient clinics or by referrals from NHS staff or outside cardiologists. Electrophysiology consults are often encountered from any other service in the hospital. The majority of the patients are on the 7N and 8N telemetry units. Patient rounds usually take place about 10 a.m. every morning. Rounds take approximately two hours. Rounding in the afternoon may also take place depending on the patient care needs such as new consults, which need to be staffed. Admissions are scheduled from the clinics at NHS or from the outreach sites. The patients are admitted for evaluation, initiation of new or different drug therapy, or for a specific procedure. The nurse practitioners are responsible for coordinating discharge planning. There will be other patients who will need history and physicals to be performed on admission under other circumstances. At any one time, the patient census is usually between 4-8 patients.

Responsibilities for the Rotation:

The fellow with the medical resident is responsible for the daily organization of the service. The electrophysiology faculty and staff meet every day to discuss all the patients. This is generally held in the fellow's library on the 6th floor in the Cardiology Section. The fellow is expected to be on rounds daily. The fellow will discuss patient triage with the fellow on general cardiology so those patients with certain diagnoses are assigned to the appropriate service. The fellow may be called to see patients in the ER as well. He or she can assign patients to the resident or student to make sure that everyone has a broad exposure to different types of patients. As on the general service, no clinical responsibility should prevent the fellow from attending scheduled conferences. Procedures such as cardioversion or temporary pacemaker placement require that a staff be present to supervise.

The call for this rotation is including in the general call schedule. Please see the guidelines for the General Cardiology rotation.

Educational Activities:

The fellow is expected to participate in the education of the resident and students during the month. This can take the form of bedside teaching, ECG review or other such small group didactic sessions. These activities will be evaluated by the residents and students and become part of their evaluation as well as potential nomination for fellow teacher of the year.

The attending on the service will review ECG's and holters with the fellow, resident and students. This may include ECG reading in the heart station and reviewing teaching ECGs of various arrhythmia. Patient management will be discussed in conjunction with the reviews. Small didactic sessions will be conducted on rounds or in small discussions to amplify the topics discussed in the Friday curriculum. The fellow should use the attached COCATS ECG outlines as a basis for determining the knowledge requirements for ECG interpretation. In addition, the topics listed in the rotation outline will be covered and should form the basis for a general understanding of arrhythmia management in additional to those listed in the "Goals" section.

Content for these rotations will come from the text *Heart Disease*, authored by Braunwald.

Evaluation Process:

The fellow will be evaluated on his or her knowledge of the subjects outlined above. This will include the acquiring of the skills to appropriately evaluate patients with arrhythmia with regard to diagnosis, proper utilization of tests, and treatment strategies. The fellow will also be evaluated on their knowledge of pacemakers and ICD follow-up. Familiarize yourself with the cardiology section evaluation forms. This is designed to the fellow assessment of their competency in the fundamentals of arrhythmia management.

1. Clinical Arrhythmia Diagnosis and Management
2. Diagnostic Evaluation
    a. History
    b. Utility of the surface ECG
    c. Noninvasive evaluation (holter, event recorder, SAECG, treadmill, heart rate variability)
    d. Indications and diagnostic usefulness of the invasive electrophysiology test
    e. Head up tilt testing
    f. Newer techniques for arrhythmia diagnosis
3. Management of Specific Clinical Syndromes (with selected electrophysiologic correlations)
    a. Atrial Fibrillation
    b. Atrial Flutter
    c. Superventricular Tachycardia
        1. AV nodal reentry
        2. WPW
        3 Atrial Tachycardia (focal, reentrant, incisional related to surgery for congenital heart disease)
    d. Inappropriate sinus tachycardia
    e. Premature ventricular contractions
    f. Nonsustained ventricular tachycardia
    g. Sustained ventricular tachycardia

h. Sudden Cardiac Death
i. Polymorphic ventricular tachycardia
j. Syncope of unknown origin (to include neurally mediated syndromes)

4. Implantable Devices
    a. Indications for temporary transvenous pacemakers (to include bradyarrhythmias, BBB, and heart block with and without infarction)
        1. Techniques
        2. Follow-up
        3. Complications
    b. Indications for permanent pacemaker implantation (to include in-depth discussions of sick sinus syndrome, BBB, hemiblocks)
    c. Pacemaker electrocardiography with trouble shooting
    d. Pacemaker programming and follow-up
    e. Indications for implantable defibrillators
    f. General aspects of ICD function and their applicability to individual patient management

Electrocardiographic Items

Anatomy and Electrophysiology

1. Anatomy of the specialized conducting system (sinoatrial node, atrioventricular (AV) node, His bundle, bundle braches
2. Spread of excitation in the ventricles
3. Difference between unipolar and bipolar leads
4. Einthoven triangle; frontal and horizontal lead reference system
5. Vectorial concepts
6. Significance of a positive and negative deflection in relation to lead axis
7. Relation between electrical and mechanical activity

Technique and the Normal ECG

8. Effect of improper electrode placement (limb and pre-cordial)
9. Effect of muscle tremor
10. Effect of poor frequency response of the equipment
11. Effect of uneven paper transport
12. Measurement of PR, QRS, QT, normal values
13. Normal ranges of axis in the front plane
14. Effect of age, weight and body build on the axis in the frontal plane
15. Normal QRS/T angle
16. Differential diagnosis of normal ST-T, T wave variants (e.g., “juvenile” pattern and early repolarization syndrome)

Arrhythmia: General Concepts

17. Reentry, automaticity, triggered activity
18. Aberattion (various mechanisms)
19. Capture and fusion complexes
20. Escape (passive, accelerated) complexes or rhythms: atrial, junctional and ventricular)
21. Interpolated premature beat
22. Parasystole (atrial, junctional, ventricular), modulated parasysteole
23. Vulnerability
24. Exit block
25. Reciprocation
26. Concealed conduction
27. Supernormality

Arrhythmia: Recognition

Sinoatrial Rhythm

28. Sinus tachycardia
29. Sinus bradycardia
30. Sinus arrhythmia
31. Sinatrial arrest
32. Sinoatrial block

Atrial Rhythms

33. Atrial premature complexes (conducted, nonconducted)
34. Atrial tachycardia (ectopic)
35. Atrial tachycardia with AV block
36. Atrial fibrillation
37. Atrial flutter
38. Multifocal atrial tachycardia
39. Wandering atrial pacemaker - mutlifocal atrial rhythm

Atrioventricular Node (Junctional)

40. Premature functional complexes
41. Atrioventricular node reentrant tachycardia (common and uncommon type)
42. Nonparaoxysmal junctional tachycardia - accelerated junctional rhythm
43. Atrioventricular reentrant or circus movement tachycardia with an accessory pathway (fast and slow)
44. Escape complex or escape rhythm

Ventricular

45. Ventricular ectopic complexes
46. Accelerated idioventricular rhythm
47. Ventricular tachycardia: uniform (monomorphic), multiform (pleomorphic or polymorphic), sustained, nonsustained, bidirectional and torsades de pointes
48. Ventricular flutter, ventricular fibrillation
49. Ventriculotrial conduction
50. Ventricular escape or idioventricular rhythm

Atrioventricular Dissociation Due to

51. Slowing of dominant pacemaker
52. Accelerated of subsidiary pacemaker
53. Above with depression of AV conduction
54. Third-degree AV block
55. Isorhythmic AV dissociation

Atrioventricular block

56. First degree
57. Second degree: 2:1, Mobitz type I (Wenckbach), Mobitz type II, high degree AV block
58. Third-degree AV block (complete)
59. Significance of wide versus normal QRS complex

Waveform Abnormality

Abnormalities of Replarization (concept of primary and secondary ST-T wave change); Abnormalities of U Wave; Ventricular Hypertrophy

60. Left ventricular hypertrophy: criteria for left ventricular hypertrophy; specificity and sensitivity of criteria
61. Right ventricular hypertrophy: criteria for right ventricular hypertrophy; sensitivity and specificity of the criteria
62. Biventricular hypertrophy
63. Electrical alternans

Atrial Abormalities

64. Criteria for left atrial abnormality
65. Criteria for right atrial abormality
66. Biatrial abnormality
67. Clinical significance of atrial abnormalities

Intraventricular Conduction Disturbances

68. Anatomic and electrophysiologic basis for intraventricular conduction defeats
69. Criteria for incomplete and complete left bundle branch block

70. Criteria for the diagnosis of incomplete and complete right bundle branch block
71. Criteria for left anterior and posterior fascicular blocks
72. Concept of combined bundle and fascicular blocks
73. Inderminate intraventricular conduction defects
74. Diagnosis and classification of pre-excitation syndromes (e.g., Wolff-Parkinson-White syndrome

Myocardial Ischemia and Infarction

75. Transient ischemia and injury
76. Normal and abnormal Q waves
77. Noninfarction Q waves
78. Differential diagnosis of tall R wave in right precordial leads
79. Theoretic basis of ECG changes in acute myocardial infarction (Q, ST-T waves)
80. Time course of ST segment changes in acute myocardial infarction
81. Diagnosis of myocardial infarction (without Q waves)
82. ST segment changes in conditions other than myocardial infarction
83. Localization of myocardial infarction
84. QRS residuals of old myocardial infarction
85. Reliability of QRS and ST segment changes in myocardial infarction in previously abnormal ECG: intraventricular conduction defects; ventricular hypertrophy
86. Overall assessment of serial ECGs as to the probability of acute myocardial infarction

Pacemaker

87. Fixed-rate pacemaker
88. Atrial pacing
89. Ventricular demand pacing
90. Atrial triggered ventricular paced
91. Atrioventricular dual pacing
92. Malfunction: demand acting as fixed rate: failure to sense; slowing of rate; acceleration of rate; failure to capture; failure to pace (inappropriate inhibition)

Exercise ECG Test

93. Criteria for a positive response
94. Significance of an abnormal baseline ECG
95. Significance of heart rate and blood pressure response (normal and abnormal)
96. Sensitivity: false negative (incidence and principle causes)
97. Specificity: false positive (incidence and principle causes)
98. Significance of magnitude of ST segment changes

Clinical Diagnoses (selected)

99. Hyperkalemia

100. Hypokalemia
101. Hypercalcemia
102. Hypocalcemia
103. Long QT syndrome (congenital and acquired)
104. Atrial septal defect, secundum
105. Atrial septal defect, primum
106. Dextrocardia
107. Mitral stenosis
108. Chronic obstructive pulmonary disease
109. Acute cor pulmonale
110. Pericardial effusion
111. Acute pericarditis
112. Hypertrophic cardiomyopathy
113. Central nervous system disorder
114. Myxedema
115. Hypothermia
116. Sick sinus syndrome
117. Digitalis effect or toxicity
118. Effects of other drugs (e.g. tricyclid, antiarrhymic, agents
119. Possible proarrhythmic effects

Adult Cardiology Fellowship Training Guidelines and Curriculum for Invasive Monitoring and Diagnostic Service at University Hospital and the OVAH

Introduction:

The basis for rotation through the Cardiac Catheterization Laboratory is to thoroughly familiarize the Cardiology Fellow with the basic principles necessary to safely and efficiently acquire the data necessary for delivering effective care and therapeutics to the various process and diseases referred to the Cardiologist. Emphasis is not only on the safe performance of these techniques, but also on appropriate selection of patients and indications for the procedures. In addition, the faculty is expected to discuss the above with the fellow for each particular situation and to assist in analysis of the data and application of the data to the particular clinical situation.

Each Cardiology Fellow is expected to have the opportunity to spend at least six months in the Catheterization Laboratory. Some Fellows may elect or need more exposure, depending on their individual goals and dexterity. In this period of time, it is expected that the Fellow will participate in and/or be the primary operator in at 200 (usually 250) diagnostic catheterizations (right heart, left heart catheterization, coronary angiography). In addition, the Fellow will have the opportunity to be involved in the planning and discussion of interventional techniques of various kinds (detailed below).

Fellows are expected to consult with Faculty on a daily basis regarding issues on indication for procedures, selection of procedure, performance of procedure, analysis of data, formulation of an effective report of the findings, presentation of the findings to Cardiac Catheterization Conference, and follow-up of the patient. Fellows are encouraged to observe in the operating room the various surgical procedures resulting from data and plans developed in the catheterization laboratory and conference. Feedback is expected from faculty on a case by case and daily basis regarding errors in performance, development of skills, formulation and analysis of data (both hemodynamic an angiographic), and decision-making post-catheterization.

Specialized skills, such as endomyocardial biopsy, intra-aortic balloon insertion and pericardiocentesis will be taught to each fellow as cases arise. Alternative approaches to insertion of catheter (such as brachial and internal jugular vein) will be taught on an ongoing basis. Thorough discussion of the indications, contraindications, risks, and performance of these techniques will also take place. In addition, Senior Fellow and those with specific goals of interventional training will be exposed to PTCA, atherectomy, and discussion of other noval interventional modalities.

All procedures will be correlated with clinical data. The Fellow is encouraged to attend clinic-pathological conferences and will be expected to present data and discuss patient care at many of these. He will be expected to be aware of all information available regarding these cases.

In summary, the minimum expectations at the end of the three years is that the Cardiology Fellow will be qualified to evaluate a patient for invasive procedures, prepare the patient for the procedure, perform basic diagnostic cardiac catheterization and angiography (to include coronary angiography), evaluate the data, formulate an effective treatment plan based on the data, and care for the patient in the post-procedure phase. He/she is expected, in addition, to be able to communicate the above both verbally and with written words to his colleagues, the referring physician, and especially the patient. He will also be qualified to percutaneously insert intra-aortic balloons, insert and evaluate right heart catheters in the ICU area, and perform diagnostic and emergent pericardiocentesis.

Didactic interactions with our Fellows are continuous throughout the curriculum. Standard texts are available to the Fellow to complement his laboratory experience. Fellows are expected to read and study this text beyond the specific given in the outline. Faculty and Fellows are also expected to keep abreast of evolving literature regarding invasive and interventional issues published in peer-reviewed journals and selected articles will be covered and discussed on a regular basis, both in the laboratory and at "Journal Club". Faculty evaluation of the strengths and weaknesses of the above program will be ongoing. Regular feedback to the trainee will occur both from the faculty in the catheterization laboratory and from the fellow evaluation committee in an effort to maximize the individual's process and correct deficits in training.

VA Cardiology Fellow Rotation:

VA Medical Center Cardiology catheterization lab and consult fellow guidelines for patient transfer requiring mechanical intervention. The following guidelines have been established to facilitate the comprehensive understanding of the requirements needed for efficient transfer of patients requiring mechanical intervention.

Nebraska Medical Center (UNMC) Referrals:

The following responsibilities will be handled by the fellows and/or attending physicians:

1. Films-transport or arrange transportation of the films to UNMC.
2. Notify the nurse coordinator/case manager regarding possible referrals.
3. Discuss Percutaneous Coronary Intervention (PCI) with the interventional fellow at UNMC.
4. Discuss emergency coronary artery bypass graft operation with the resident on surgery service at UNMC.
5. Attending to attending discussion of patient transfer when appropriate.
6. The attending physician will obtain approval for the procedure from the chief of staff at the VA.
7. Order Plavix does as indicated for Percutaneous Coronary Intervention (PCI).

8. Coordinate the above with the nurse coordinator/case manager as needed for an efficient referral.

The responsibilities of the nurse coordinator/case manager at the VA Medical Center are as follows:

1. Schedule intervention (PCI or CABG operation) date with receiving site and nurse coordinator/case manager for the cath lab. If surgery is indicated contact the nurse coordinator/case manager for Dr. Duncan.
2. Notify and educate the patient regarding the procedure, cardiac rehabilitation, and options that are available to the patient.
3. Coordinate outpatient procedure date with the nurse coordinator/case manager at UNMC.
4. Obtain referrals to the cardiac rehabilitation, lipid clinic, and dietician.
5. Schedule follow-up appointment in the intervention clinic (4 weeks) and with the primary care physician (cardiologist) in for months.
6. Confirm travel arrangements with the business office at the VA Medical Center.
7. Obtain cost memos for approval if procedure is performed after 24 hours from the diagnostic left heart catheterization.
8. Documentation of the above process should be entered into CPRS.
9. Notify necessary department at the VA Medical Center regarding the scheduling of procedure.
10. Obtain and provide documentation of demographics, history and physical exam, all necessary laboratories including carotid Doppler and pulmonary function tests as indicated.

Minneapolis VA Medical Center Referrals for Coronary Artery Bypass Graft (CABG) operation and/or valve replacement/repair procedures.

Responsibility of the cardiology fellow/attending:

1. Notify the nurse coordinator/case manager at the VA Medical Center as soon as possible.
2. Enter all necessary consults into a CPRS including dental for valvular procedures, hematology, urology, pulmonary function test, and carotid Doppler studies as indicated. If additional consults are indicated the cardiology fellow will evaluate on an individual basis.
3. Nurse coordinator/case manager should notify cardiology fellow regarding any order that have been entered into CPRS that require a signature.
4. Provide nurse coordinator/case manager with a pager and or contact number in the event additional information is needed from the receiving site.
5. Attending to attending discussion of case should always be performed for emergent transfers.

6. Obtain approval for a procedure and air ambulance travel from the chief of at the VA Medical Center.
7. Provide continuous support for nurse coordinator/case manager regarding medication and consults as needed.

Responsibility of nurse coordinator/case manager:

1. Notify UNMC/Creighton of possible referral and coordinate release of information and transfer of films to Minneapolis.
2. Continuous monitoring of patient status in coordination with cardiology fellow and attending.
3. Arrange travel date and transfer.
4. Provide referrals to cardiac rehab, lipid clinic, dietitian, and social services as needed.
5. Order all necessary laboratory tests as needed.
6. Coordinate and provide test results to receiving center, demographics, history and physical exam, and all other necessary documents.
7. Enter surgery referral date and all necessary information regarding process into CPRS.
8. Determine appropriate bed status for transfer patient in consultation with cardiology team i.e. telemetry vs. ICU bed.
9. Provide patient with financial options available for procedure if not performed at the VA Medical Center.
10. Provide teaching information to patient regarding the procedure and answer questions appropriate for nurse coordinator/case manager regarding logistics of procedure, including family support.
11. Schedule all follow-up appointments:
    a. Post-op follow-up with nurse coordinator and primary care physician in 1 week.
    b. Interventional clinic follow-up in 4 weeks.
    c. Primary care post-op follow-up in 4 months.

VA Nurse Coordinator/Case Manager

Jean Brady 346-8800 ext. 5315

UNMC Nurse Coordinator/Case Manager

Faye Sorenseon	559-7576 (Office)	888-4755 (Pager)
Cheryl Shin	559-7528 (Office)	

Cardiology Fellowship: Invasive Monitoring and Diagnostics

I. Basic Hemodynamics:

1. Waveforms: Basic components and theory of pressure measurement.
   a. Pressure signals
   b. Frequencies, frequency responses, natural frequency, sensitivity
   c. Damping, Theory of Wheatstone Bridge, transducers
   d. Artifacts, errors in measurement

2. Blood Flow:
   a. Cardiac Output (definition, description), A-V02 difference
   b. Ranges of normal Cardiac Output; normal; factors influencing blood flow
   c. Measurement of Cardiac Output: Indicators dilution techniques
      i. Fick
      ii. Green Dye
      iii. Thermodilution
   d. Sources of error

3. Vascular Resistance
   a. Physics of blood flow, Poiseuille's Law
   b. Impedance
   c. Calculations of vascular resistance
   d. Clinical; systemic, pulmonary diseases, drug

4. Cardiac Valvular Stenosis
   a. Gorlin formula, modified formula, mitral valve area, aortic valve area
   b. Potential errors
   c. Clinical use

5. Shunts
   a. Clinical suspicion
   b. Detection of shunts in the laboratory
      i. Oxymetry in the laboratory
      ii. Calculation of pulmonary blood flow
      iii. Systemic blood flow calculation
      iv. Bidirectional shunts

II. Cardiac Catheterization Principles

1. Angiography
   a. Principles of X-ray, radiation exposure, imaging, cine
   b. Contrast agents

2. Complications: Death, myocardial infarction, vascular accidents, CVA, arrhythmia, infectious, reactions to contrast, renal function.

III. Techniques of Cardiac Catheterization

1. Cut down approaches to vascular entry
   a. Anatomy of the brachial approach
   b. Techniques of exposure of the brachial vessels
   c. Catheters
   d. Complications, repairs, follow-up

2. Percutaneous vascular entry
   a. Anatomy of the groin
   b. Femoral venous and arterial puncture
   c. Right heart catheterization (standard catheter and flow directed)
   d. Left heart catheterization (standard pigtail and wire assisted)
   e. Contraindications, complications, monitoring
   f. Use of heparin during catheterization; reversal of heparin
   g. Transeptal Catheterization, Brockenbrough, Mullins sheath, flouroscopic landmarks, complications

3. Angiography
   a. Ventriculography: Catheters, catheter placement, angles, injection rate and volume, complication recognition, review of hazards of contrast agents Methods of calculation of ventricular volume and ejection fraction Evaluation of specific wall motion abnormalities and aneurysm Evaluation of and quantification of mitral insufficiency
   b. Coronary
      i. Indications (correlate with discussion of literature, textbook, and clinical experience)
      ii. Brachial techniques (Sones, Judkins, Amplatz, etc.)
      iii. Femoral techniques: Catheter types and sizes, details of attachment

to manifolds, catheter movements, selection of catheter for ifference in anatomy, bypass graft consideration

iv. Coronary Anatomy review. Appearance of coronary anatomy relative to view angles, etc.
v. Stenoses: Identification, quantification, description, assessment of flow with stenotic segments.
vi. Collaterals
vii. Bypass grafts
viii. Internal Mammal grafts
ix. Coronary spasm
x. Anomalous coronary anatomy
xi. Vasodilator reserve, response to NTG, Adenosine (discussions and demonstration during research protocols)
xii. Potential errors in interpretation

c. Pulmonary Angiography
   i. Indications
   ii. Contraindications
   iii. Techniques
   iv. Complications
   v. Discussion of clinical correlation
d. Aortography
   i. Catheter choices
   ii. Catheter placement
   iii. Camera angles
   iv. Injection rates
   v. Anatomy: normal and diseased
   vi. Complications

IV. Evaluation of Cardiac Function

1. Review of basic physiology
   a. Oxygen uptake, cardiac output
   b. Responses of physiologic parameters to stress, exercise, disease
   c. LV systolic performance
      i. Frank-Starling mechanism/LV pressure-volume curves
      ii. LV stroke work
      iii. End-systolic stress relations
      iv. Effects of disease states on LV systolic performance
      v. Effects of drugs on LV performance (clinical correlations)

2. LV diastolic performance

a. Discussion of LV stiffness
b. Effects of drugs on LV diastolic performance
c. Effects of specific disease states on diastolic performance

3. LV failure/RV failure

V. Consideration of Specific Disorders

1. Valvular Heart Disease (clinical, hemodynamics, angiographic)

2. Coronary Artery Disease (clinical, hemodynamics, angiographic)

3. Dilated Cardiomyopathy/Hypertrophic Cardiomyopathy (with reference to appropriate indications for invasive assessment, provocative testing, response to intervention such as inotropic Rx)

4. Pulmonary disease

5. Constrictive and Restrictive Disease/Cardiac Tamponade

6. Overview of Congenital Heart Disease with adult survival

7. Overview of Operated Congenital Heart Disease with adult survival

VI. Advanced Techniques

1. Pericardiocentesis: Concurrent with discussion of pericardial disease and indications for pericardiocentesis (both therapeutic and diagnostic)
   a. Anatomical considerations
   b. Choices/alternatives regarding approaches
   c. Choices needles
   d. Techniques of pericardiocentesis
   e. Hemodynamic monitoring during and after pericardiocentesis
   f. Laboratory evaluation of pericardial fluid
   g. Correlation with echocardiography

2. Pacemaker insertion (temporary, both in lab and in CCU): To be correlated with instructions by EP service.
   a. Internal juglar approach
   b. Indications
   c. Thresholds/pacing rates/physiologic correlations
   d. Complications

3. Endomycardial Biopsy

a. Indications
b. Techniques
c. Bioptomes/anatomy
d. Histology (correlative and disease process)

4. Intraaortic Balloon Insertion (Percutaneous)
   a. Indications
   b. Techniques, including initial and follow-up adjustment of pump
   c. Equipment
   d. Complications
   e. Weaning

5. Interventional Coronary Artery Techniques
   a. PTCA: Introductory exposure of indications, comparison with surgery, risk factors (lesion and patient specific), complications, pre and post-procedures medical care, post-hospital care and monitoring.

   b. Atherectomy: Introductory exposure to indications, comparison with surgical and PTCA approach to stenoses, risk factors, appropriate selection (both patient and lesion specific) pre and post-procedure case, post-hospital care, controversies surrounding novel technologies.

   c. Intravascular Ultrasound (IVUS): Introductory exposure to the technology and general theory of the equipment, anatomy, indications for use, research applications, correlation with histopathology.

VII. Cost of Invasive Diagnostic and Interventional Procedures

1. Discussion of cost of the equipment both in terms of Initial acquisition, but also in terms of maintenance/upkeep

2. Discussion regarding cost to the patient to include potential for complications and increase costs resultant

Catheterization Cardiology Monthly Rotation Goals and Objectives

Catheterization Cardiology Curriculum

Month 1
- Pre-operative and post-operative evaluation
- Introduction to vascular access
- Introduction to coronary anatomy
- Introduction to catheters

Month 2
- Hemodynamics - basic
- Right heart catheterization
- Endomyocardial biopsy

Month 3
- Hemodynamics - advanced

Month 4
- Valvular cases

Month 5
- Hih-risk diagnostic cases
- Groin closure devices

Month 6
- Advanced catheter manipulation

Month 7
- Advanced catheter manipulation - continued

Month 8
- Arm access - brachial and radial

Month 9
- Intra-aortic balloon pumps
- Full spectrum catheter manipulation - continued

Month 10
- Full spectrum catheter manipulation - continued

Month 11

Full spectrum catheter manipulation - continued

Month 12

Introduction to interventional techniques
Intravascular ultrasound
Pressure wire

University Nebraska Medical Center
Cardiovascular Fellowship

Catheterization Program Requirements

II. Level 1

1. Minimum of 4 months

2. Minimum 100 procedures

III. Level 2 (Independent Operator)

1. Minimum 12 months training during which time minimum of 300 procedures (With 200 as primary operator)

III. Level 3 Training must be performed during a fourth year of fellowship dedicated primarily to coronary interventional training. This pertains to the dedicated Interventional Fellowship.

1. Minimum 300 procedures
2. 125 procedures with primary responsibilities
3. Research

Training Guidelines and Curriculum for Interventional Cardiovascular Fellowship at UNMC

Requirements

Candidates must be in or have completed an ACGME approved cardiovascular medicine fellowship program. They must be certified in internal medicine by the American Board of Internal Medicine.
Fellows starting the program should have a current certification in basic and advance life support as per the American Heart Association.

Duration

The interventional cardiovascular fellowship program is one year induration as required by the ACGME and ABIM.

Goals

1. The overall goal is to provide the interventional cardiology fellow sufficient training and experience to function as an independent interventional cardiologist.

2. The fellow will be able to effectually manage patients with ischemic heart disease and valvular disorders. This will focus on three areas to include pre-procedures, peri-procedures and post-procedure care. Pre-procedure planning to include appropriate patient and device selection. Peri-procedure management to include delivery of the device, assessment of results and management of complications. Post-procedure care will involve the management of patients and any sequela of complications.

Objectives

1. Management of patients in the emergency setting, intensive care units and outpatient setting.
2. Understanding the mechanism, indications, and contraindications of pharmacological treatments.
3. Understand the evaluation and management of ischemic heart disease and valvular disorders. This will include the acute presentation of myocardial infarction and unstable angina as well as follow-up long tern care.
4. Acquire knowledge in the interpretation of coronary ateriograms, ventriculograms, hemodynamcis, intravascular ultrasound and coronary vascular flow physiology.
5. Management of mechanical complications related to percutaneous procedures.

6. Indications, contraindications and management of intra-aortic balloon pumps.
7. Acquire the technical manipulation of multiple types of interventional devices.

Description of the Rotation

The interventional cardiovascular service is an outpatient and inpatient service. The major focus is the inpatient service. This inpatient service is based exclusively at the Nebraska Health System (NHS) consisting of the combined University and Clarkson Hospitals. The one and half year old cardiac catheterization laboratory is located in the Clarkson Hospital building. There are two intensive care units and three telemetry units at the Nebraska Health System. The interventional fellowship includes two full-time academic interventional cardiologists and two clinically appointed private practice interventional cardiologists. The interventional fellows' training is provided by the full complement of interventional faculty members. The interventional service consists of one to two academic staff attending physicians each day, an interventional fellow and a cardiovascular fellow assigned to the catheterization laboratory. Patients are referred to the interventional service from the inpatient ward services. These are patients on the cardiology primary service or those on other services who are being followed with cardiology in consultations. Some patients are admitted to the Interventional inpatient service. These include patients referred initially as outpatients who undergo an interventional procedure requiring a minimum of an overnight hospitalization. The interventional procedure may have been electively scheduled in a patient with know coronary artery disease or ad hoc following a diagnostic catheterization. Patients requiring longer hospitalization and more intensive care are admitted to the primary cardiology service. There is also a significant number of patient referred from the Omaha VA Medical Center either as in patient transfers or scheduled out patients. The VA invasive case manager and cardiology case manager at NHS coordinate the transfer and follow-up care. The patients are admitted to one of three telemetry units (7N, 8N, and 5W) or one of two intensive care units. Patients rounds are twice a day. The first time is in the morning prior to starting in the catheterization laboratory. The second is in the afternoon prior to catheterization conference. Rounds generally last from 30 to 60 minutes.

All patients are seen by the attending and interventional fellow prior to the procedure. The history, physical examination, laboratory data, electrocardiograms, chest x rays and prior catheterization studies are reviewed by the attending and interventional fellow. The indications, methods and potential outcomes of the procedure are discussed with the interventional fellow. The cardiovascular catheterization fellow is allowed to participate in most but not all of the interventional cases. A history and physical is dictated for the outpatient or inpatient transfers by the interventional fellow. The attending writes a pre-procedure note on all patients. The discharge summary for patients on the interventional service is preformed by the interventional fellow. The case manager is responsible for coordinating discharge

planning. The number of patients undergoing interventional procedures averages 3 to 4 per day. The outpatient service is based at the Omaha VA Medical Center. This clinic is staffed one half day per week by the interventional attending, interventional fellow and VA invasive case manager. The primary purpose is for follow up care of VA patients who have undergone interventional procedures in the Nebraska Health System or other outside facilities. Most of the remaining patients seen in the clinic are for follow up care having undergone coronary bypass surgery. The average number of patients seen in clinic is eleven.

The interventional fellow is also very active in the cases performed by the clinical appointed private practice members who are an integral part of the interventional fellowship program. The fellow participates in the care of these patients, hospitalized at the Nebraska Health System, in the same manner as the other interventional faculty.

The fellow is required to be an active participant in a research project. This may be bench research in an animal laboratory or clinical based medicine. A project will be identified in the third year of their cardiovascular fellowship. The goal is to publish and present the study at the end of their training year. The interventional fellow will write the proposal and submit it the Institutional Review Board (IAB) or Institutional Animal Care and Utilization Committee (IACUC). A supervisory interventional attending will be involved with the projects. The cardiology division has a clinical research nurse available. The fellow is required to complete a two week long Clinical Research Course provided by the University Nebraska Medical Center to train fellows and residents in statistical methods and research proposal writing. The fellow will meet monthly with the attending to review the ongoing progress with the project.

Responsibilities for the Rotation

The interventional fellow is responsible for all aspects of care for patients admitted to the interventional service and of the care related to the procedure of those patients assigned to the primary cardiology service or other services. The fellow will discuss all aspects of the planned care for the patients with the appropriate faculty member and is expected to be on rounds twice daily with the attending which averages 3 to 4 patients per day. He/she will attend the daily catheterization conference. The fellow is required to actively participate in a research project. One day a week will be assigned for research time. Call is one week a month exclusively at the Nebraska Health System. The interventional fellow does not make rounds on the weekends. The interventional fellow will participate in the interventional clinic for one half day per week at the Omaha VA Medical Center on Tuesday mornings.

The interventional fellow will submit a list of interventional procedures monthly to the fellowship coordinator. The target number of procedures is between 300 to 400 cases per year. The fellow may be asked to reduce the number of clinical laboratory days if it appears that he/she is averaging more than this amount.

Educational Activities

The fellow will have the opportunity to be both student and teacher. There is a series of didactic interventional lectures that will be taught predominantly by the interventional faculty. These lectures have been incorporated in this series. The fellow is required to attend the daily cath conference located in the cardiology clinic area at the University Hospital. This conference is designed to review the entire laboratory cases performed daily at the NHS and Omaha VAMC. This is an opportunity to discuss management of issues and outcomes with other cardiology faculty members and cardiovascular surgeons in attendance. The fellow will also be an active participant in the interventional fellowship journal club. The interventional fellowship journal club, which meets once a month, is designed to provide critical analysis of published interventional data to include the evaluation of the role of randomized clinical trials and registries in clinical decision making. Small didactic session will be conducted on rounds or in the catheterization laboratory.

The fellow will function as a teacher for the medical students, residents and cardiology fellows/staff. The fellow may give one lecture or small group discussion on a general cardiology topic to second year medical students. They are also given the opportunity on a volunteer basis to give a formal lecture on an interventional topic for the cardiology division. They will also be required to present their research to the cardiology division.

The interventional fellow will be sponsored for attendance at the annual Transcatheter Therapeutics Conference and for the meeting of their research presentation. There is a quarterly citywide interventional conference sponsored by the Interventional Cardiology Division of the University Nebraska Medical Center. This conference is attended by academic and private physicians from Omaha and Lincoln, Nebraska and Western Iowa.

GENERAL OBJECTIVES

The general objectives of the training program in Interventional Cardiology are to enable trainees to:

1. Understand the basic pathophysiology and principles of coronary artery disease and valvular disease
2. Make appropriate judgments and clinical decisions regarding the treatment of coronary artery disease, including acute and chronic coronary syndromes, as well as valvular heart disease
3. Know the indications, risks and benefits of coronary angiography and percutaneous revascularization techniques, including angioplasty, stenting, atherectomy, embolic protections, rheolytic thrombectomy and intra-aortic balloon counterpulsation and become proficient in these procedures
4. Know the indications, risks and benefits of temporary transvenous pacing
5. Understand the indications for independently interpret and become proficient in the use of fractional flow reserve measurements and intravascular ultrasound
6. Become familiar with the indications for and techniques of balloon valvuloplasty, alcohol septal ablation, and percutatneous closure of patent foramen oval (PFO) and atrial septal defect (ASD)
7. Understand the principles of coronary imaging including radiations safety, limitations of fluroscopic imaging and recording equipment
8. Evaluate and independently care for patients with acute coronary syndromes including acute myocardial infarction, chronic coronary artery disease, and valvular heart disease, with knowledge of the latest proven pharmacologic as well mechanical interventions
9. Understand and appropriately interpret clinical trial data regarding acute and chronic coronary syndromes and valvular heart disease with proper integration into patient care

SPECIAL OBJECTIVES

The specific objectives of the training program are included on a separate handout

ACHIEVING OBJECTIVES

The goals of achieving these objectives are accomplished by:

1. Direct attending supervision is mandated for all coronary and valvular diagnostic and interventional cases. This allows direct supervision of the fellows with observation and evaluation of procedural techniques as well as providing reinforcement for good clinical judgment and practice
2. Daily morning patient rounds with discussion of patient cases with the Interventional Cardiology attending physician. These discussions center on the acute patient

management issues and review of the cases as well as the indications and complications of any patient procedures. Basic pathophysiology and recent applicable clinical trial data are discussed with an emphasis on their relative importance to each case

3. Weekly conferences with attending and fellows in attendance. These conferences review recent publications, recent interesting cases, and a didactic review session. A list of meetings and their topic for the past year is attached
4. Weekly attendance in the outpatient clinics of the faculty interventional cardiologists. This allows the trainees to evaluate the clinical results of their interventions and their complications
5. Monthly Quality Assurance review with attending(s) and fellows to discuss any complications or difficult management decisions

Direct patient care

Pre-procedural care

History and physical examination

Assessment of laboratory studies, electrocardiograms, X rays, prior catheterization studies,

Interaction with patient and family

Peri-procedural care

Appropriate utilization of equipment

Identification and management of complications

Post-procedural care

Appropriate medical management

Follow up care

Identification and management of complications

Interaction with patient and family

Interpretation of:

Coronary arteriograms

Ventriculography

Hemodynamics

Intravascular ultrasound

Doppler flow

Fractional flow reserve (intracoronary pressure assessment)

Management of complications including:

Coronary dissection

Coronary thrombosis

Coronary vasospasm

Coronary artery perforation

Slow flow or no flow
Cardiogenic shock
Left main artery dissection
Peripheral vascular complications
    Embolization
    Dissection
    Occlusion
    Pseudoaneurysm
Cardiac tamponade
Bleeding complications
    Access site hemorrhage
    Hematomas
    Retroperitoneal bleed

Technical manipulation regarding:

Guide catheter engagement of normal and anomalous coronary ostia
Deployment of intracoronary balloons
Deployment of stents
Rotational atherectomy
Directional atherectomy
Distal protection devices
Intravascular ultrasound
Fractional flow reserve (intracoronary pressure wire)
Brachytherapy
Cutting balloons
Vascular closure devices

Evaluations

The fellow will be evaluated in several general areas by the interventional faculty on a monthly basis. The faculty member(s) are required to discuss the monthly evaluation with the fellow. The fellow will meet with the interventional program director every three months for general review. One area of evaluation will be direct patient care as outlined below. This will include pre-procedural planning and assessment, peri-procedural planning and assessment, peri-procedural and post-procedural care. The fellow will be evaluated regarding their record keeping ability and timeliness of medical charts. Failure to maintain the procedure log or medical records will result in temporary suspension from clinical duties until completed. Fellows will also be evaluated regarding their interaction with support staff, professional colleagues and patients and their families. The fellow will evaluate the interventional faculty on a monthly basis. These evaluations will be discussed with the faculty by the interventional

program director quarterly.

The fellow will be evaluated on his or her knowledge and skill regarding the following areas of interventional cardiology.

Ongoing and informal feedback is provided for all fellows by the attending physicians on all diagnostic and interventional cases

1. Quarterly performance written evaluations of the fellows are provided by the Interventional Cardiology attending physicians. These are reviewed privately with each fellow to provide ongoing performance feedback.
2. Twice annual performance reviews are done with all fellows by the Program Director

A list of reference texts and videotapes within the curriculum is provided as an attachment.

Selected Reading Material: (Provide to the interventional fellow)

Textbooks

Heart Disease - Braunwald
The Heart - Hurst
Textbook of Interventional Cardiology - Topol
Manual of Interventional Cardiology - Safian and Freed Journals

Journals

Journal of the American College of Cardiology
Circulation
Catheterization and Cardiovascular Interventions

INTERVENTIONAL CARDIOLOGY FELLOW TRAINING PROGRAM
(dedicated fellow)

Specific Educational Objectives

BASIC OF IMAGING

1. Basic radiation physics

2. Basic radiation safety
    a. Understanding risks of radiation use
    b. Understanding the process of radiation injury
    c. Understanding and implementing techniques to minimize exposure

3. Understanding how an imaging intensifier works

4. Understanding of different types of contrast agents and their associated risks

5. How to optimize angiographic images

6. Basic ultrasound physics
    a. Understand the indications for use of an intravascular ultrasound catheter
    b. Understand the limitations of an intravascular ultrasound catheter
    c. Learning to interpret intravascular ultrasound images

BASIC PHYSIOLOGY OF CORONARY ARTERIES

1. Normal vascular endothelial and smooth muscle cell function

2. Determinants of coronary flow

3. Collateral circulation
    a. Recognition and function

4. Influence of various pharmacologic agents upon the vascular wall

5. Atherosclerosis
    a. Stages of coronary atherosclerosis with understanding of associated cellular and subcellular changes within the coronary artery wall
    b. Effect of atherosclerosis upon coronary blood flow

6. Response to vessel injury by:

a. Plaque rupture
b. Balloon-mediated injury
c. Stent-mediated injury
d. Radiations (brachytherapy)

7. Influence of micro-and macro-particle embolization upon coronary blood flow
8. Basic hematology
   a. Platelet Biology
      i. Normal platelet function
      ii. Activated platelet states
      iii. Interaction of platelets and vessel wall
      iv. Interaction of platelets and other blood elements, including coagulation factors
   b. Coagulation
      i. Normal coagulation pathways (intrinsic and extrinsic activation)
      ii. Common pathway activation
      iii. Interaction of other blood elements, including platelets

CORONARY ARTERY DISEASE

I. Stable ischemic syndromes
   A. Definition
      1. Role of noninvasive testing
      2. Angiography
         a. Indications for and risks of coronary angiography
         b. Efficacy and log-term outcomes of percutaneous interventions including
            i. Balloon angioplasty
            ii. Coronary stenting
               1. Bare-metal stents
               2. Drug-eluting stents
            iii. Coronary atherectomy
               1. Rotational

   B. Treatment options

      1. Medical therapy
         a. Differentiate between the several pharmacologic agents available
         b. Understand the mechanism of action of each class of drug
         c. Understand the indications and contraindications for each drug
         d. Pharmacodynamics and pharamocokinetics of each drug

      2. Surgical therapy

a. Indications for surgery
b. Comparison to medical therapy and PCI
c. Surgical techniques and outcomes

II. Acute coronary syndromes

A. Definition

B. Clinical Management
1. Initial risk assessment and pharmacologic management
a. Antiplatelets therapies
i. Aspirin
ii. Clopdogrel
iii. Glycoprotein IIb/IIIa receptor inhibitors
b. Antithrombotic therapies
i. Unfractionated heparin
ii. Low-molecular weight heparin
1. Indications
2. Contraindications
3. Clinical data compared to primary angioplasty
4. Outcomes

C. Role of "rescue" angioplasty

D. Peri-procedural issues

1. Pharmacology
a. Antiplatelet therapies
i. Aspirin
ii. Clopidogrel
iii. Glycoprotein IIb/IIIa receptor inhibitors
b. Antithrombotics
i. Unfractionated heparin
ii. Low molecular-weight heparin
iii. Direct thrombin inhibitors

2. Mechanical
a. Ensuring adequate and appropriate angiography
b. Guiding catheter selection
c. Guidewire selection
d. Balloon selection
e. Coronary stenting role and selection

f. Temporary pacemaker wire
    i. Indications
    ii. Contraindications
    iii. Management
g. Utility of intra-aortic balloon counterpulsation
    i. Indications
    ii. Contraindications
    iii. Management

E. Post-procedural management

1. Medical therapy
    a. Aspirin
    b. Beta-blockers
    c. ACE-inhibitors
    d. Other antiplatelet
        i. Clopidogrel
        ii. Glycoprotein Iib/IIIa receptor inhibitors

    e. Antithrombotics
        i. Unfractionated heparin
        ii. Low molecular weight heparin
    f. Lipid management

III. Restenosis

A. Understand the basic pathophysiology

B. Differentiate between PTCA-induced and stent induced restenosis

C. Treatment options

1. PTCA Restenosis
    a. Repeat balloon angioplasty
        i. Indications
        ii. Acute outcomes
        iii. Long-term outcomes
    b. Coronary stenting
        i. Indications
        ii. Acute outcomes
        iii. Long term outcomes
    c. Role of brachytherapy

2. In-stent restenosis

a. Balloon angioplasty
    i. Indications
    ii. Acute outcomes
    iii. Long term outcomes
b. Coronary stenting ("Stent sandwich")
    i. Indications
    ii. Acute outcomes
    iii. Long term outcomes
c. Role of brachtherapy
    i. Indications
    ii. Contraindications
    iii. Acute outcomes
        1. Need for longer antiplatelet therapy
    iv. Long term outcomes
d. Potential role of drug-eluting stents
    i. Current limited trial data

IV. Saphenous vein graft disease

A. Understand the difference in pathobiology of aterialized vein grafts

B. Treatment of SVG lesions

1. Balloon angioplasty
    a. Indications
    b. Acute outcomes
    c. Long term outcomes
2. Coronary stenting
    a. Indications
    b. Type of available stents
        i. Sizes
        ii. PTFE-covered vs. base metal
    c. Acute outcomes
    d. Long term outcomes
3. Use of embolic protection devices
    a. Strategies
        i. Balloon occlusion
        ii. Filter type
        iii. Proximal
    b. Acute outcomes
    c. Long term outcomes

V. Internal mammary artery disease

A. Indications for intervention

1. Balloon angioplasty
    a. Acute outcomes
    b. Long term outcomes
2. Coronary stenting
    a. Indications
    b. Acute outcomes
    c. Long term outcomes

VI. Chronic Total Occlusions

A. Definition

B. Indications for intervention

1. Balloon angioplasty
    a. Acute outcomes
    b. Long term outcomes
2. Coronary stenting
    a. term outcomes

C. New devices

1. Acute outcomes
2. Long term outcomes

Valvular Heart Disease and Congenital Heart Disease

I. Mitral stenosis
    A. Diagnosis
        1. Importance of medical history
        2. Understanding the physical examination findings
        3. Use of other diagnostic modalities, including echocardiography
        4. Natural history
    B. Treatment
        1. Mitral valvuloplasty
            a. Indications
            b. Role of surgical valve replacement
            c. Procedural techniques
                i. Inoue balloon
                ii. Double balloon
            d. Risks
            e. Benefits
                i. Acute outcomes
                ii. Long term outcomes

II. Aortic stenosis

    A. Diagnosis
        1. Physical examination findings
        2. Medical history
        3. Use of other diagnostic modalities, including echocardiography
        4. Natural history

    B. Treatment
        1. Aortic valvuloplasty
            a. Indications
            b. Role of surgical replacement
            c. Procedural techniques
            d. Risks
            e. Benefits
                i. Acute outcomes
                ii. Long term outcomes

III. Pulmonic stenosis

    A. Diagnosis
        1. Physical examination findings
        2. Medical history

3. Use of other diagnostic modalities, including echocardiography
4. Natural history

B. Treatment
1. Pulmonic valvuloplasty
a. Indications
b. Role of surgical replacement
c. Procedural techniques
d. Risks
e. Benefits
i. Acute outcomes
ii. Long term outcomes

IV. Atrial Septal Defect and Patent Foramen Ovale
A. Diagnosis
1. Echo criteria for percutaneous procedure
2. Clinical criteria for percutaneous closure
B. Treatment
1. Amplatzer ASD closure device
a. Techniques
b. Complications
2. CardioSeal/StarFlex PFO closure device
a. Techniques
b. Complications

V. Hypertrophic Cardiomyopathy

A. Diagnosis
1. Clinical criteria for treatment
2. Echo and cath lab criteria for treatment

B. Treatment
1. Alcohol septal ablation
a. Techniques
b. Complications

MANAGING COMPLICATIONS

I. Vascular
A. Bleeding Hematoma
1. Local
2. Retroperitoneal
B. Laceration
C. Aneurysm and pseudoaneurysm
D. Rupture

E. Indications for vascular surgery
F. Indications for percutaneous repair

II. Cardiac Tamponade
    A. Definition
    B. Recognition
    C. Incidence
    D. Utility of laboratory diagnosis
        1. Echocardiography
        2. Hemodynamics
    E. Treatment
        1. Percardiocentesis
            a. Indications
            b. Risks
            c. Benefits

III. Coronary perforation
    A. Recognition
        1. Hemodynamic monitoring
        2. Echocardiography
    B. Incidence
    C. Treatment
        1. Conservative vs. more aggressive management
            a. Techniques
                i. Balloon tamponade
                ii. Covered stenting
    D. Need for periocardiocentesis

IV. Cardiogenic shock
    A. Recognition
    B. Incidence
    C. Treatment: hemodynamic support
        1. Intraaortic counterpulsation
        2. Vasopressors
V. Coronary vasospasm
    A. Recognition
    B. Incidence
    C. Treatment options
        1. Medical
            a. Nitrate preparations
            b. Calcium-channel blockers
            c. Anticholinergics

VI. Embolization and “No-reflow” states
    A. Recognition
    B. Incidence
    C. Treatment
        1. Medical
            a. Nitrate preparations
            b. Calcium-channel blockers
            c. Adenosine
        2. Mechanical
            a. Intraaortic balloon counterpulsation

VII. Contrast-associated nephropathy
    A. Recognition
    B. Incidence
    C. Treatment
        1. Intravenous fluids
        2. Role of renal-protective agents
            a. N-acetylcysteine
            b. Fenoldopam

MISCELLANEOUS

I. Ethics
   1. Understand ethical issues in the care of all patients
   2. Understand the important of frank discussions with patients regarding risks and benefits
   3. Understand the potential financial influences upon patient care giver interactions

II. Statistics
   1. Understand basic statistical methodologies
   2. Be able to differentiate between statistical methods in:
      a. Clinical trial design
      b. Clinical trial interpretation ***Lecture Topics****:*

Hemodynamic studies

Vascular restenosis
- Pathophysiology
- Animal models
- Gene transfer and therapy
  - Role and limitations

Non-angiographic assessment of coronary stenosis
- Fractional flow reserve
- Intravascular ultrasound
- Doppleer flow

Coronary anatomy
- Normal variants
- Anomalies
- Assessment
  - TIMI flow
  - Normal
  - Slow flow/no flow
- Dissections

Radiation physics, biology and safety

Cath lab complications
- Identification
- Management

Pharmacologic drugs (pathophysiology and utilization)
- Antiarrythmics
- Vasopressor agents
- Vasodilators
- Thrombolytics
- Antiplatelet agents
- Anticoagulant technologies

Brachtherapy

New device technologies

Interventional Cardiology Monthly Rotation
Goals and Objectives

Interventional Cardiology Curriculum

Month 1

1. Learn the indications, composition of angioplasty wires
2. Learn the indications for angioplasty guides
3. Learn about the type of angioplasty balloons
4. Learn indications, contraindications, method of deployment, complications of closure devices

Month 2

1. Learn type of stents
2. Begin passing angioplasty wires
3. Begin passing balloon

Month 3

1. Begin passing stents
2. Introduction to intravascular ultrasound and fractional flow reserve
3. Research update

Month 4

1. Brachy therapy
2. Drug eluting stents
3. Covered stents
4. Continue primary operator

Month 5

1. Rotational atherectomy
2. Directional atherectomy
3. Continue primary operator

Month 6

1. Distal protection devices
2. SVG graft cases
3. Research update

Month 7

1. Depressed LV function cases
2. Continue primary operator

Month 8

1. Continue primary operator

Month 9

1. Research update
2. Continue primary operator

Month 10

1. Continue primary operator

Month 11

1. Continue primary operator

Month 12

1. Research update
2. Continue primary operator

Training Guidelines and Curriculum for General Cardiology Service at University Hospital and the OVAH

Duration:

Our program uses the COCATS recommendations in this regard. The COCATS documents itself are merely guidelines. These must be modified to ensure at a minimum, adequate training and flexibility to satisfy the professional goals of the trainee and the ACGME requirements. The fellow must spend a minimum of eight months in this rotation over the three year fellowship. More may be required if deficient areas are observed in the evaluation of an individual trainee.

Goals:

1. Exposure to patients with a wide variety of cardiovascular disease processes focusing on their diagnosis and management, including postsurgical care.
2. Provide a basis for which the trainee can understand and manage cardiovascular diseases as they impact upon other organ systems from medical, surgical and psychological aspects.
3. Develop independence as a cardiology physician in patient care.
4. Proper utilization of cardiac tests in patient management.
5. Appreciate the importance of and implement risk prevention measures in cardiovascular medicine.
6. Understand the importance of and implement risk prevention measure in cardiovascular medicine.
7. Acquire skills in the following areas in conjunction with other rotations: Proper performance of the history and physical examination, electrical cardioversion, right heart catheterization, temporary pacemaker insertion and follow-up, arterial cannulation, interpretation of ECG's, and invasive and non-invasive test as they pertain to care on this rotation. More depth training will be had on the individual rotations such as Cath Lab and Echo, etc.

Description of the Rotation:

The General Cardiology service consists of a faculty member, a fellow when assigned, a medical resident, and 1-2 medical students. In addition there are two case managers who are responsible for coordination of the patient care, setting up procedures such as catheterizations and discharge teaching and planning. They also case manage certain patient populations and follow clinical outcomes data. The service is responsible for caring for primary inpatients as well as consultations on other medical and non-medical services with general cardiac problems. It takes place primarily on the telemetry unit on 5West/7North Clarkson, but also involves care of the ICU and post-operative patients. The 5West/7North Clarkson telemetry unit has the capabilities of following Swan Ganz catheters, temporary pacemakers as well as rhythms with a

sophisticated monitoring system. There is a patient care meeting in the conference room in the nursing station at 9:00 a.m. every morning. There the patients are discussed with the important contributions of the nursing staff to review the progress over the prior evening and plans for that day. Patient care rounds are made thereafter with the team mentioned above. Consultations and admissions are performed as needed. Additional afternoon rounds may be done depending on the patient care needs and faculty preference. The service has, on average, 10-20 patients at any time.

The VA service only differs in that it is a consultative service with no primary patients. The rounding times are more at the staff's discretion and there is no group meeting with the nursing staff on the respective floors. The expectations otherwise are the same.

VA Cardiology Fellow Rotation:

VA Medical Center Cardiology catheterization lab and consult fellow guidelines for patient transfer requiring mechanical intervention. The following guidelines have been established to facilitate the comprehensive understanding of the requirements needed for efficient transfer of patients requiring mechanical intervention.

University Nebraska Medical Center (UNMC) Referrals:

The following responsibilities will be handled by the fellows and/or attending physicians:

1. Notify the nurse coordinator/case manager regarding possible referrals.
2. Discuss Percutaneous Coronary Intervention (PCI) with the interventional fellow at UNMC.
3. Discuss emergency coronary artery bypass graft operation with the reseince on surgery service at UNMC.
4. Attending to attending discussion of patient transfer when appropriate.
5. The attending physician will obtain approval for the procedure from the chief of staff at the VA.
6. Order Plavix does as indicated for Percutaneous Coronary Intervention (PCI).
7. Coordinate the above with the nurse coordinator/case manager as needed for an efficient referral.

The responsibilities of the nurse coordinator/case manager at the VA Medical Center are as follows:

1. Schedule intervention (PCI or CABG operation) date with receiving site and nurse coordinator/case manager for the cath lab. If surgery is indicated contact the nurse coordinator/case manager for Dr. Gangahar.
2. Notify and educate the patient regarding the procedure, cardiac rehabilitation, and options that are available to the patient.
3. Coordinate outpatient procedure date with the nurse coordinator/case manager at

UNMC.

4. Obtain referrals to the cardiac rehabilitation, lipid clinic, and dietician.
5. Schedule follow-up appointment in the intervention clinic (4 weeks) and with the primary care physician (cardiologist) in for months.
6. Confirm travel arrangements with the business office at the VA Medical Center.
7. Obtain cost memos for approval if procedure is performed after 24 hours from the diagnostic left heart catheterization.
8. Documentation of the above process should be entered into CPRS.
9. Notify necessary department at the VA Medical Center regarding the scheduling of procedure.
10. Obtain and provide documentation of demographics, history and physical exam, all necessary laboratories including carotid Doppler and pulmonary function tests as indicated.

UNMC/Creighton Referrals for Coronary Artery Bypass Graft (CABG) operation and/or valve replacement/repair procedures.

Responsibility of the cardiology fellow/attending:

1. Notify the nurse coordinator/case manager at the VA Medical Center as soon as possible.
2. Enter all necessary consults into a CPRS including dental for valvular procedures, hematology, urology, pulmonary function test, and carotid Doppler studies as indicated. If additional consults are indicated the cardiology fellow will evaluate on an individual basis.
3. Nurse coordinator/case manager should notify cardiology fellow regarding any order that have been entered into CPRS that require a signature.
4. Provide nurse coordinator/case manager with a pager and or contact number in the event additional information is needed from the receiving site.
5. Attending to attending discussion of case should always be performed for emergent transfers.
6. Obtain approval for a procedure and air ambulance travel from the chief of at the VA Medical Center.
7. Provide continuous support for nurse coordinator/case manager regarding medication and consults as needed.

Responsibility of nurse coordinator/case manager:

1. Notify Minneapolis of possible referral and coordinate release of information and transfer of films to Minneapolis.

2. Continuous monitoring of patient status in coordination with cardiology fellow and attending.

3. Arrange travel date and transfer.

4. Provide referrals to cardiac rehab, lipid clinic, dietitian, and social services as needed.

5. Order all necessary laboratory tests as needed.

6. Coordinate and provide test results to receiving center, demographics, history and physical exam, and all other necessary documents.

7. Enter surgery referral date and all necessary information regarding process into CPRS.

8. Determine appropriate bed status for transfer patient in consultation with cardiology team i.e. telemetry vs. ICU bed.

9. Provide patient with financial options available for procedure if not performed at the VA Medical Center.

10. Provide teaching information to patient regarding the procedure and answer questions appropriate for nurse coordinator/case manager regarding logistics of procedure, including family support.

11. Schedule all follow-up appointments:
    a. Post-op follow-up with nurse coordinator and primary care physician in 1 week.
    b. Interventional clinic follow-up in 4 weeks.
    c. Primary care post-op follow-up in 4 months.

VA Nurse Coordinator/Case Manager
Jean Brady 346-8800 ext. 5315
UNMC Nurse Coordinator/Case Manager
Faye Sorenson 559-7576 Office 888-4755 Pager

Responsibilities for the Rotation:

The fellow with the medical resident is responsible for the daily organization of the service. He or she should see the patients before formal clinical patient care rounds. All the information necessary to evaluation or care for the patients should be know when available preparation for patient rounds. The fellow is responsible for making sure that the data is present, but can assign the tasks of gathering such information to the other team members (resident or students). Consultations requested are to be seen by either the resident or fellow primarily, but the fellow should go over the case with the resident before presentation to the faculty when time permits. All new admission history and physicals, consultations, and discharge summaries are to be dictated by either the resident or fellow. Only a brief note need be written in the charge for history and physicals and consultations since they are dictated as well.

Rounds occur on a daily basis with the faculty. The fellow is expected to be present unless there is an emergency to be handled or the fellow is in his or her continuity care clinic. Consultations may come from the Emergency Department or other services. The general cardiology fellow is often called about all consults including those which might best be handled by the Electrophysiology or CHF service. The fellow should triage such patients accordingly to the appropriate fellow or faculty on the respective service. In addition to seeing consultations in the ICU, the General Cardiology service is responsible for following all post-op open heart patients. These patients remain on the Cardiothoracic service until transferred to the **5West/7North Telemetry** unit at which time they become the primary patients of the Cardiology service.

The fellow is responsible for making the faculty aware of the need for the placement for swan ganz catheters, temporary pacemakers and electrocardioversion. These must be supervised by the faculty. Catheterization or interventional procedures should be scheduled through **Faye Sorensen**, the case manager.

The fellow will be expected to take call during this rotation not to amount to more than one in every third night. Fellow call on Wednesdays and Thursdays are without a resident. The staff on call should be informed of each consult or admission.

Training Guidelines and Curriculum for the Nuclear Medicine Rotation

DURATION:

The ACGME and the COCATS has determined guidelines for the minimum amount of training in Nuclear Medicine. Two months minimum training is required for Level I competency and is the minimum requirements for completion of the fellowship training program. For level 2 and 3, 4-6 months and 12 months are recommended respectively.

GOALS:

1. To understand the indications, sensitivity, specificity, diagnostic accuracy and pitfalls of nuclear medicine techniques.

2. Understand the basic tenets for the performance of nuclear studies.

3. Learn the performance and interpretation of myocardial perfusion imaging and radionuclide angiography.

4. Correlate the information with angiographic data.

5. Gain knowledge of pharmacology and physiology of commonly used stress agents.

6. Acquire a fundamental knowledge of radiation safety.

7. Develop the skills for actual “hands on” performance of nuclear studies.

DESCRIPTION AND RESPONSIBILITIES OF THE ROTATION:

Currently done at OVAMC.

EDUCATIONAL ACTIVITIES:
Nuclear reading sessions are held throughout the year on Monday and Thursday afternoons from 5:00 to 6:00 PM. All fellows are invited.

Elective Clinics

Cardiothoracic Surgery Elective Curriculum

Staff Physicians
Dr. Kim Duncan, Chief
Dr. Ali Khoynezhad
Dr. Tracy Dorheim

Eligibility

1. Second and third year cardiology fellows
2. Approved by cardiothoracic staff physicians

Objectives

1. Expose fellows to the surgical treatment of cardiac disease.
2. Learn the intra operative management and postoperative care of cardiac surgery patients
3. Recognition and treatment of possible postoperative complications
4. Understand the preoperative evaluation of cardiac patients from a surgical perspective
5. Understand appropriate outpatient follow-up of cardiac surgery patients

Cardiology Fellows Role on the CT Team

1. Participate as an observer in the operating room during CABG and valve replacement surgery
2. Participate as an operator in the implantation of pacemakers and ICD's. Perform the history and physical for these cases.
3. Assist in daily care of inpatients on the cardiothoracic surgical service
4. Assist in the outpatient follow-up of cardiac surgery patients

Conferences

1. Cardiology fellows are required to attend routine Tuesday, Wednesday and Thursday at 7:00 lectures
2. Cardiology fellows will give one conference per month to the cardiothoracic surgical residents and interns covering general cardiology topics. Possible topics may include conduction disturbances, common arrhythmia, antiarrhythmic drugs or congestive heart failure.

Call Responsibility

The cardiology fellows will continue to take general cardiology call.

LIPID CLINIC

GOALS AND OBJECTIVES

The UNMC Lipid Clinic exists to aggressively modify cardiovascular risk in both primary and secondary preventive efforts. It is integrated system with onsite nutritional counseling by a registered dietician at each clinic visit and is set up on a nurse managed model with longitudinal frequent feedback with firm goal setting, frequent serial laboratory monitoring, and aggressive long-tern pharmacologic and lifestyle intervention. There are currently approximately 450 patients enrolled in the UNMC Lipid Services Clinic.