

RESIDENT RESOURCE BOOK



PLASTIC SURGERY RESIDENCY PROGRAM



July 2005

**The University of Texas Medical Branch
Division of Plastic Surgery
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INTRODUCTION

This compilation of materials is designed to assist the Plastic Surgery Resident in successfully completing the educational experience with a minimum of confusion.

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FREQUENTLY CALLED NUMBERS

Shriners Hospital for Children	770-6600
815 Market Street	
Galveston, Texas 77555-1220	
Plastic Surgery Office	770-6741
Operating Room	770-6788
Lounge	770-6808
Clinic	770-6698
Wound Healing Lab	770-6738
Dr. Herndon's Office	770-6728
Dr. Hegger's Office	770-6664
Longitudinal Study Office	770-6845
3 East	770-6760
Quantitative Cultures	770-6880

University of Texas Medical Branch	21257
301 University Boulevard	
Galveston, Texas 77555-0724	
Plastic Surgery Clinic	27472
Plastic Surgery Appointments	27357
Plastic Surgery Billing	77335
Burn Unit	22023
Admitting Office	73606
Campus Police	21503
OT Department	23060
Social Work Intake Office	21541
OR Main Desk	21245
OR Posting	23266

Miscellaneous

Richmond State School	713/342-4681
Brenham State School	713/836-4511
Austin State School	512/454-4731
TEX-AN to UTMB	800/392-6440
Dr. Meier TIRR	713/797-1440
CCD (James P. Rambin)	512/465-2667

Labs

Clinical Lab	21234	CAT Scan	762-7005
X-Ray Reports	21110	X-Ray File Room	21110
Surgical-Pathology Reports	22853	Bacteriology	21738
Dermatology	22242		
Quantitative Cultures	21327		

BEEPER LISTING

FACULTY

Linda G. Phillips, M.D.	643-1482
John D. Bauer, M.D.	945-5871
Steven J. Blackwell, M.D.	643-1454
Lisa J. Gould, M.D., Ph.D.	643-9432
John P. Hegggers, Ph.D.	643-2063
Garry W. Killyon, M.D.	943-3363
Robert L. McCauley, M.D.	643-9465

RESIDENTS

John Antonetti, M.D.	942-6250
Michael Bass, M.D.	645-5182
Joseph Berardi, M.D.	645-5283
Kimberly Carpin, M.D.	645-5330
Angela Champion, M.D.	643-9950
Peter Chang, M.D.	643-4531
Faridy Cocco, M.D.	645-5245
Richard Ethridge, M.D., Ph.D.	645-5511
Jennifer Geoghegan, M.D.	643-1078
Julie Holding, M.D.	645-5518
Carlos Mata, M.D.	643-2459
Wesley Myers, M.D.	643-4541
Nicole Nemeth, M.D.	645-5906
Michael Obeng, M.D.	943-3623
Kendall Roehl, M.D.	643-4309

LABORATORY

Zhen Li, M.D., Ph.D.	943-3316
Qing Chang	770-6737
Luke Zhang, M.D., Ph.D.	770-6737

FACULTY TIME

CLINIC	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
A.M.	BLACKWELL	BAUER (8-11:30)	BLACKWELL (Cleft)	McCAULEY (8-10am)	GOULD
P.M.	*BLACKWELL (3 rooms) *KILLYON (4 rooms)	PHILLIPS (12:30-4:00) BAUER (3:30-4:00)	BLACKWELL (Cleft)	PHILLIPS	GOULD *BAUER (2-4pm)
UTMB O.R.	PHILLIPS (Room 10) BAUER (Room 11)	BLACKWELL (Room 10: 1 st - 3 rd - 5 th Tuesday) McCAULEY (Room 10: 2 nd - 4 th Tuesday)	GOULD (Room 10) BAUER (Room 11)	GOULD (Room 10) PHILLIPS (Room 10) BAUER (Room 10)	BLACKWELL (Room 10) **KILLYON (Room 10)

*Clinic: Dr. Blackwell will be at the Clear Lake Clinic every other Monday morning and at the UTMB-UHC every Monday afternoon.
 Dr. Killyon will be at the Clear Lake Clinic every other Monday Morning and will not have afternoon clinic at the UTMB-UHC on those days
 Dr. Bauer will be at the Harborside Clinic every Friday afternoon.

**Operating Room: Dr. Blackwell has preference to Room 10 the 1st, 3rd and 5th Tuesdays
 Dr. McCauley has preference to Room 10 the 2nd and 4th Tuesday s
 Dr. Gould has preference in Room 10 on Thursday followed by Dr. Phillips, followed by Dr. Bauer
 Dr. Killyon will have preference on the 1st and 3rd Friday
 Dr. Blackwell will have preference on the 2nd and 4th Friday

WEEKLY SCHEDULE

Monday

5:00 p.m. Indications Conference – (monthly)
 Hand Conference

Tuesday

6:30 a.m. Staff Rounds at 7A & 7B – alternate every other week

5:00 p.m. Journal Club

Wednesday

1st Wednesday of each month:

7:00 a.m. ENT/PRS Face Conference

8:00 a.m. Surgery Grand Rounds

2nd Wednesday of each month: (Plastic Surgery Library)

7:00 a.m. Educational Conference (2 hrs.)

3rd Wednesday of each month: (Plastic Surgery Library)

7:00 a.m. Morbidity & Mortality Case Conference (2 hrs.)

4th Wednesday of each month: (Plastic Surgery Library)

7:00 a.m. Resident's Conference (Plastic Surgery Library)

 Attending's Conference (Dr. Phillips' Office)

TEACHING AND ADMINISTRATIVE CONFERENCE

Conference will start promptly at 7:00 a.m. on the designated Wednesdays. Please be prompt to allow for assembly and announcements. The two hours will consist of two thoroughly prepared didactic presentation by a resident with appropriate discussion to follow. The resident should prepare and distribute a list of annotated references pertinent to the topic.

On the third Wednesday of each month, the conference will cover the morbidity and mortality for the preceding month. Each case is to be concisely presented and analyzed by the resident, after which it will be discussed by the Faculty members. The patient list should be ready one week in advance, pictures, and pertinent lab and X-ray data obtained. Attending staff should be contacted one week prior to the conference to discuss the patients involved.

In preparation for conference, be sure to discuss the subject being presented with the appropriate attending at least one week prior to the presentation.

GENERAL POLICIES

1. Plastic Surgery Residents will be expected to maintain a professional appearance and demeanor in their contacts with patients and other health care professionals. You are our main PR agent! COURTESY WITH NURSES, ATTENDANTS AND OTHER SUPPORT STAFF PAYS DIVIDENDS TO ALL OF US.
2. It is important to gain and maintain good rapport with patients. A frequent criticism is that we talk too much about patients and too little with them. Remember that you may not need to see or talk to each patient each day, but the patient needs to see and talk to you each day. This includes children.
3. It is essential that residents be available and in contact with the residency coordinator in the division office. Use the pager system effectively, keep the coordinator informed where you can be reached. Check mailboxes at least once per day.
4. Promptness is essential in the operating room, on rounds, in clinics, and at conferences.
5. Operative notes and discharge summaries should be dictated the day of surgery and/or discharge. Delinquent dictations are reason for withdrawal of OR privileges until caught up. Zero tolerance exists for delinquencies.
6. Consultations should be seen the day they are requested, and in all cases within 24 hours. Contact appropriate Attending to see and write or sign note.
7. Patients are admitted under service of attending responsible for case and Attending is immediately notified of admission, and the case is discussed.
8. A Plastic Surgery Resident will write a succinct admitting note on all patients.
9. Each resident is entitled to vacation. In general, no more than two weeks are to be taken at once. **NO VACATIONS WILL BE GRANTED DURING THE MONTHS OF JUNE AND JULY.** All vacation leave requests must have approval signatures from appropriate Faculty Attending and the residents providing coverage prior to submitting to Dr. Phillips for final approval. Accrued vacation time not taken by graduation will be reimbursed by the Hospital. Preference is given to meetings over vacation when the schedule is arranged. Six days are allotted for job interviews during residency – the months of June & July should be avoided.
10. Each Resident must keep a running record of their operative experience for annual report to the Residency Review Committee. Keep this up to date. The PSOL must be submitted monthly for review with Drs. Phillips and Gould.
11. Residents are allowed to attend meetings at which they are presenting. Prior to submitting papers/posters/abstracts to meetings the following must be done: Complete and submit the Presentation Proposal form to Dr. Phillips for approval to submit. After her approval of the proposal form, submit manuscript to Dr. Phillips **NO LESS** than 2 weeks prior to departure for meeting. Failure to abide by this rule will result in cancellation of meeting attendance by that resident and result in future restrictions for resident to submit presentations.

GENERAL POLICIES
(continued)

12. All consult sheets should be signed by the faculty and placed in the department's Billing mailbox the day they are seen.
13. ER consult copies should be returned to the file room the following day after your call.
14. All emergency admissions require notification of the involved resident service by the next A.M.
15. 2nd call starts at 17:00h on weekdays and is all day/night on weekends. From 7:00 – 16:59h the Service Chief of the 1st call will provide back-up.
16. The Chief Resident ensures that the O.R. schedule is called in to Operating Room Posting Office @ 23266 two days in advance of scheduled cases.

TO: All Faculty and Residents

RE: Coverage of TDC Service during Chief Residents out of campus rotation

- I. Friday's clinic will be covered under the direction of the Administrative Chief Resident.
- II. Emergency Room admissions and hospitalized patients will be followed by the On-call Faculty's Service. All admissions should be brought to the attention of the Chief Resident on call and the following morning, to the Admitting faculty's service.
- III. Elective cases will be included in the elective schedule for the Administrative Chief Resident's service.
- IV. A complete log of all cases to be scheduled for admission with their diagnosis, procedure, date of admission and tentative surgery will be kept by Senior Residents.
- V. Discharges will be done as in John Sealy Hospital; by the operating resident or resident following patient, not by the intern, except if intern is the primary surgeon of the case.
- VI. All elective cases are to be presented to the specific faculty, with adequate documentation, consents, photos, and plan of treatment.
- VII. In the event of a back-log of elective cases, those accumulated will have priority in their treatment the following month, according to the next available operating room time; regardless of the diagnosis and degree of difficulty.
- VIII. Any clinics to be canceled must be cleared by Dr. Phillips. The TDC-J Clinic requires written notification AT LEAST TWO WEEKS IN ADVANCE.

GUIDELINES FOR PLASTIC SURGERY HOUSE STAFF/ WOUND HEALING RESEARCH FELLOW TRAVEL

Plastic Surgery House Staff are encouraged to present at academic/professional meetings in the field of Plastic and Reconstructive Surgery and Wound Healing Research. There are, however, guidelines that must be followed depending upon the source of funds for reimbursement.

There are two sources of funding from which travel is reimbursed – Division funds and Shriners Burns Institute grant funds. Residents/Fellows are asked to complete the appropriate travel authorization forms for the appropriate funding agency at least one month prior to travel. There are a number of offices that these forms must pass through before travel is approved. This is especially true for the Shriners Burns Institute, as any travel must be approved by the Local Board of Governors prior to travel, and the Board meets only once each month. The residency coordinator is available to assist you with the proper completion of your travel and reimbursement forms. Plane reservations can be booked on-line or through Marchi Travel (762-2612).

It is necessary that you discuss your intent to submit a presentation with Dr. Phillips prior to it being submitted to any association or society.

Prior to submitting papers/posters/abstracts to meetings the following must be done:

Complete and submit the Presentation Proposal form to Dr. Phillips for approval to submit. After her approval of the proposal form, submit manuscript to Dr. Phillips **NO LESS** than 2 weeks prior to departure for meeting. Failure to abide by this rule will result in cancellation of meeting attendance by that resident and result in future restrictions for resident to submit presentations.

Some internal guidelines to remember are:

1. All travel forms must have documentation attached; i.e., meeting flyer with registration form. This must include the name of the meeting, dates for the meeting, and where the meeting is being held. If you are presenting, a copy of your presentation (i.e. abstract) and a copy of your letter of acceptance is required.
2. Original receipts and invoices are required for all reimbursements, as well as the original canceled airline ticket.
3. Meal per diem is \$30 per day.
4. No rental cars will be reimbursed.
5. All flights must be at the lowest possible airfare.
6. Take advantage of early registration. Do not wait until the last minute and expect the Division to pay for late registration – the **Division WILL NOT PAY FOR LATE FEES.**

GUIDELINES FOR PLASTIC SURGERY HOUSE STAFF/ WOUND HEALING RESEARCH FELLOW TRAVEL

7. Once you have completed all of your travel forms, do not change your travel plans at the last minute. The University requires that any changes in travel dates (i.e. your travel authorization indicates that you will travel 7/1 through 7/15, and you change your plans at the last minute to 6/30 through 7/14 be resubmitted on a superseding travel authorization). This will only delay your travel reimbursement.
8. When possible, residents are encouraged to share rooms to reduce costs.

DO NOT TRAVEL WITHOUT PRIOR APPROVAL

Complete a Leave Request Form and Travel Authorization Form

Obtain the signatures of your back-up coverage residents, your attending faculty and then submit your leave request form to the Administration Chief Resident

Chief Resident submits signed form to Residency Coordinator for completion of process; upon Program Director's signature, travel authorization form is then submitted to department chairman for travel approval; approved form is copied and given to traveling resident.

BE SURE THAT YOU HAVE COMPLETED PRIOR TRAVEL AUTHORIZATION FORMS ACCORDING TO THE ABOVE GUIDELINES

WHEN IN DOUBT, GET A RECEIPT

Again, the residency coordinator is available to assist you with the proper forms and travel process. Please provide her with proper documentation and information regarding your travel in advance.

ADMINISTRATIVE CHIEF RESIDENT

This appointment is to administratively supervise the professional aspects of patient care.

1. Assures that the following assignments are carried out: House officer coverage of clinics, in-patients, and O.R. schedule.
2. Sees or arranges to follow all JSH consultation patients, notifies attending and visits patients with them.
3. Contacts Residents and Attendings on other services regarding all consultations.
4. Maintains call roster for resident coverage.
5. Maintains conference schedule and assigns topics.
6. Keeps Attending staff informed of all incidents, complications, and unhappy patients.
7. Supervises in-patient records – sees that progress notes, dictation, etc. are done promptly.
8. Maintains log of all complications and infections. Chiefs submit all cases performed and ensuing complications on monthly basis by the 5th of each month.
9. M&M dictations are due by the 5th of next calendar month. A list of all cases performed during that month is to be submitted. These are to be turned in to the residency coordinator.
10. Assures everyone is notified if Grand Rounds or other conferences are cancelled.
11. Informs private Attendings of monthly Journal Club and the Grand Rounds schedule.
12. Notifies laboratory personnel of all related conferences.
13. Assures conference evaluations and attendance/sign-in roster are available for each conference and submits to the residency coordinator at end of conference.

CLINIC POLICIES

1. Clinics start at 8:00 a.m.
2. All appropriate residents must be present. If residents are unavailable, the Chief Resident must obtain help
3. TDC clinic (Fridays at 8:00 a.m.) is resident controlled. All available residents are expected to assist the TDC resident.
4. Do not post a case in the schedule book until the case has been discussed with and cleared by a Senior Resident and Attending staff. This includes clearance for the day the case is scheduled.
5. Photos of elective cases pre and post-operative must be taken.
6. Paperwork: H&P, orders, consent, dictation must be completed by the end of each clinic. This must not impede the steady flow of patients.
7. Residents are expected not to wear scrubs. Professional dress is expected, including shirt and tie for men, appropriate dress for women and white coats.

SUMMARY LISTS FOR PLASTIC SURGERY CLINIC

PURPOSE: To ensure that a summary list of significant past surgical procedures, past and current diagnosis or problems, and currently and recently used medications is legibly recorded in the same location in each patient record.

POLICY: Each specialty area will designate in the medical record that the patient health care summary information will be documented.

PROCEDURE:

- I. The current medications will be recorded in the outpatient Clinic note on each visit by the physician or nurse.
- II. Current diagnosis and problems will be recorded in the outpatient clinic note by the physician or other care provider.
- III. Past diagnosis & medical problems will be recorded on the current visit outpatient note only if it is essential to the patient's care at this visit.
- IV. Clinic billing sheet must be signed.

ADMISSIONS

Adults:

1. Call extension 22711 (8:00 a.m. – 4:30 p.m.)
Speak to Administrative Coordinator
2. Day Surgery: Extension 24359
3. ER Admissions: Extension 26896, 26895 (8:00 a.m - 4:30 p.m.)
4. TDC Managed Care: Extension 7200

Pediatrics:

Call extension 23554 (8:00 a.m. – 4:00 p.m.)
Speak to Pediatric Admitting Coordinator

After 4:00 p.m. speak to Pediatric Nursing Coordinator

To schedule admissions, you must have:

NAME
UH NUMBER
DIAGNOSIS/DATE OF ONSET/SIGNS AND SYMPTOMS
DATE OF ADMISSION
LENGTH OF STAY
STAFF FOR THE DAY & CHIEF RESIDENT FOR THAT STAFF
TRANSFERRING DOCTOR AND HOSPITAL

Fill out admissions slip and give to patient to give to Admission Office (from Plastic Surgery Clinic – Elective Admissions).

Notify Chief Resident and Attending physician of all ER admissions and consults at the time of admission.

Clear all elective admissions from clinic with Senior Resident present (usually Chief Resident) and Attending staff.

Notify Chief Resident in charge of TDC about any TDC admissions during the night.

ER sheets, and copy of ER consult to be dropped off at our office for our records the following morning at the latest.

All admissions must have H&P, admit note and orders, and consent if needed. Order bedside supplies if needed.

PHOTOGRAPHS

1. Residents are responsible for taking photographs of all cases. Pre-operative photos should be made before the patient goes to the operating room, except in emergencies. All burns should be documented with photos. Read the hand-out on clinical photography carefully.
2. Intra-Operative photos are very valuable. Take them in all cases. Also, be sure to take photos of interesting x-rays.
3. Complications should be recorded with photos. This requires great diplomacy with patients!
4. Follow-up photos must be made in the clinic. The resident must take a camera to each clinic.
5. The resident will make temporary MIRROR files from the memory chip.
Remember: Pictures you take belong to the patient's Attending staff and are needed for records and medical/legal purposes.
6. The resident must remember to print pictures from the MIRROR files ten days prior to the presentation at conferences, especially **M&M**, to ensure that pictures are available for the conference.
7. No personal photographs!

MEDICAL PHOTOGRAPHY

We have converted to digital photography. Do not purchase 35mm cameras. We suggest digital cameras.

Here are some practical suggestions for physicians using medical photography in their practice:

- Avoid auto-focus cameras and lenses. If you are using macro lenses, reproduction ratios are strongly recommended to achieve consistent results.

Accurate photographs are a basic part of a patient's history and physical examination. The photograph of a surface defect or contour problem serves as a document in the same fashion as an x-ray or an electrocardiogram. It is now requested by insurance companies, courts, and by other physicians who participate in the care of the patient. The photograph also serves as a means of measuring the success or failure of the operative procedure and the postoperative period, and the photograph is the major record by which a surgeon can demonstrate a clinical research project. The photograph, in essence, is the major record presented for a manuscript. Photographic presentations of clinical problems are very much the domain of the surgeon whether he is in a private practice and is talking to hospital staff or in a teaching capacity. The quality of photographs presented by plastic surgeons at regional and national meetings and in manuscripts presented to journals is appalling considering that these individuals are purporting to be skilled and aesthetic.

CAMERAS

THE DIVISION HAS GONE TO A DIGITIZED FORMAT.
DO NOT PURCHASE LIGHT REFLEX CAMERAS.

CLINICAL PHOTOGRAPHY

The basic purpose of clinical photography is to document the status of the patient in a fashion which is reproducible. The document should be simple without distractions and should clearly illustrate the object involved. For example, a patient undergoing a rhinoplasty should have a photograph of the entire face as well as profiles and a chin up view. These photographs should be reproduced in the post-operative period exactly. This means the same angles, the same lighting and exposure, and ideally the same background. The magnification or reproduction ratio will be standardized in using a macro lens by taking all photographs of the face with a 1:10 reproduction ratio. This will also assure the lighting will be the same since the distance between the light source and the subject will be standardized. The angles of photography are important. The camera lens should be at a right angle to the plane of the subject and should be in the mid-portion of the subject. If the photograph is taken with the chin down at one time and the chin up at another time, the nose will appear longer in the chin down photograph and shorter in the chin up photograph than is actually the case. Many plastic surgeons present such photographs as documentation of changes post-operatively. They are not attempting to misrepresent the case, but have not been aware of these factors in making the documents.

MEDICAL PHOTOGRAPHY

(Continued)

Backgrounds should be plain and non-reflective. Each individual may use his own taste as to the color of background, but the most neutral color is generally a medium to dark blue. Black backgrounds are preferred by some individuals, but this appears to me to be very stark and has the only advantage that there are no shadows on the black background. White backgrounds tend to avoid contrast between the skin and the background, and are not pleasing to the eye. Distracting things in the background such as the surgeon's library tend to focus attention on the current journals and books rather than on the subject matter. Jewelry again distracts the viewer who might be paying more attention to the type of jewelry the individual is wearing than the object intended. Misguided efforts to respect the patients modestly, such as half removed clothing are actually more suggestive than totally nude. Full body photographs can be taken with the bikini underwear if the genital area is not a necessary part of the photograph.

Photographs of hands should not be placed flat on a background because positions of fingers will be disguised if pressed against a wall or table.

The primary purpose of this system is to present standardization and the details of simplifying the photographs, and avoiding misleading lighting or angle situations requires a minimal but basic attention to detail and practice.

SUGGESTED PHOTOGRAPHIC CATEGORIES

1. Breast
2. Burns: Electrical and thermal-chemical; x-ray dermatitis and ulceration
3. Cancer-skin
4. Cleft lip and cleft palate
5. Congenital deformities
6. Cosmetic: face and body
7. Ear reconstruction
8. Facial Palsy
9. Flaps and grafts
10. G-U
11. Hand reconstruction
12. Head and neck
13. Hemangioma
14. Lymphedema
15. Nevi and benign skin lesions
16. Sarcoma
17. Skin diseases and epidermolysis bullosa
18. Transsexual
19. Trauma
20. Ulcers
21. Wounds, scars, and keloids

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Converting to Digital Photography: A Model for a Large Group or Academic Practice

[SPECIAL TOPIC]

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Abstract

Digital photography has become an economical and efficient substitute for conventional photography. We recently converted our resident clinical photography to a digital format to make archiving more efficient and to save the costs of clinical photography. We present a model that can be applied to a large group or academic practice outlining the conversion of our clinical photography to digital format. We discuss the costs that we have incurred during the past 3 years of conventional photography, the economic benefit and costs for conversion to digital, and a 5-year projection of savings using digital photography. We also discuss the advantages of digital photography and the equipment needed for the conversion.

Plastic surgeons have been closely associated with photography and its practices almost since the inception of medical photography itself. This is clearly illustrated by the example of Sir Harold Gillies's remark at the First International Congress of Plastic Surgery in Stockholm: "I have been asked to speak about the important advances in plastic surgery. I think the most important advance is photography."¹ Thus, it is not surprising that when we speak of the advances of plastic surgery in the new millennium, we must include the topic of digital photography.

The goals of photography in plastic surgery have been reproducibility through standardization, a topic frequently discussed in the literature, ¹⁻⁶ and validity of presurgical and postsurgical comparisons. DiBernardo et al. ⁴ recently summarized photographic standards in regard to conventional 35-mm photography, perceptibly hinting that the future lies in digital imaging. The importance of factors such as quality photographs, macro capability, adjustable focal length, sharp depth of field, on-camera flash with external flash connectibility, adjustable settings for different lighting conditions, and attachable grids for reproducibility in conventional

photography ³ retain their importance in digital photography, but they are accompanied by additional advantages over 35-mm photography.

Digital photography has become an affordable and financially beneficial alternative to conventional 35-mm photography for use in plastic surgery. The advantages of long-term storage, easy retrieval, and database organization make digital photography even more appealing. However, the pivotal reason for a large group practice or academic center to convert to a digital format is the financial savings when compared with the cost of conventional photography (Fig. 1). We recently converted our division of six residents to digital photography and LCD projector presentations. This model can be used to exemplify the advantages for converting a multiphysician practice or academic institution to digital photography.

5 Year Projection of Savings

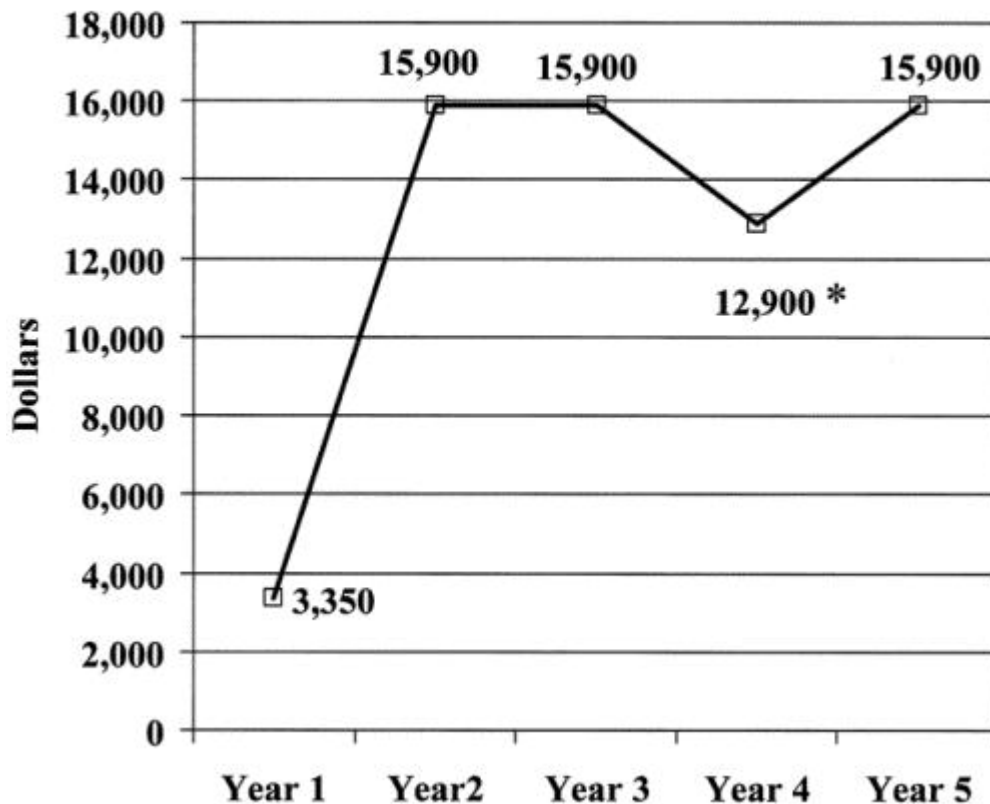


Fig. 1. Graph of projected savings over a 5-year period in dollars. Year 4 savings (*asterisk*) include the cost of a new laptop computer for hardware upgrade.

Background

Several authors have advocated the use of digital imaging in their practice. DiSaia et al. ⁷ discussed basic principles of digital photography and explored in detail the equipment necessary for a digital imaging practice. This article, like many articles

that reference technology data, information, or equipment, is outdated in its information. However, it provides a complete introduction to digital imaging. Delange and Diana [8](#) explored a cost and quality comparison of digital images and conventional 35-mm photography for use as clinical photography in plastic surgery. They concluded that digital imaging has achieved picture quality that is satisfactory for patient documentation when compared with 35-mm photography, with a definite economic benefit. Roth et al. [9](#) examined the quality of consumer-grade digital images for diagnosis of wound-healing problems, ultimately investigating its use in sending images over the Internet for communication between physicians and/or caregivers at distant sites. They concluded that relatively low-resolution images (640 × 425 × 24-bit color) were as informative as photographic slides for assessing wound conditions and wound treatment options by experienced clinicians. [9](#) Several dermatologists have advocated the use of digital imaging in their practice for monitoring precancerous and nevomelanocytic lesions and for the photodocumentation of medical records. Price and Goldstein [10](#) presented their setup of a digital imaging system and their experience with converting their practice to digital photography. Nechala et al. [11](#) obtained digital images using a digital camera; they scanned a Polaroid photograph and a 35-mm negative to compare the accuracy of facial measurements with direct anthropometry and concluded that they were not statistically different. They also discussed the advantages and disadvantages of each camera. [11](#)

The Proposal

Our division has in the past relied heavily upon our institutional photography department for services of film development, supply, and enlargement; presentation preparation, including conversion of PowerPoint files to 35-mm slides and reproductions of pictures and graphs; and manuscript preparation ([Fig. 2](#)). These services have come with significant cost to our division, including a philosophy of sacrificing cost for convenience. We have had a near open-door policy with photography, allowing all services to be billed directly to the division. In 1998, the division of five full-time faculty members, six residents, and three junior residents spent \$52,000 on photography services. Resident services, including clinical photography (slide film and processing), grand round presentations, and enlargements, totaled \$30,000 alone. Based on the potential savings of digital photography, we proposed and implemented a short-term goal (2 months) of converting resident clinical photography to digital format, incorporating computer simulation training into the curriculum (i.e., Mirror system), and requiring all presentations be given by LCD projector, thus avoiding 35-mm slide conversion costs. Our long-term goal (1 to 2 years) is conversion to a digital format for the entire division.

Cost: Photography Services

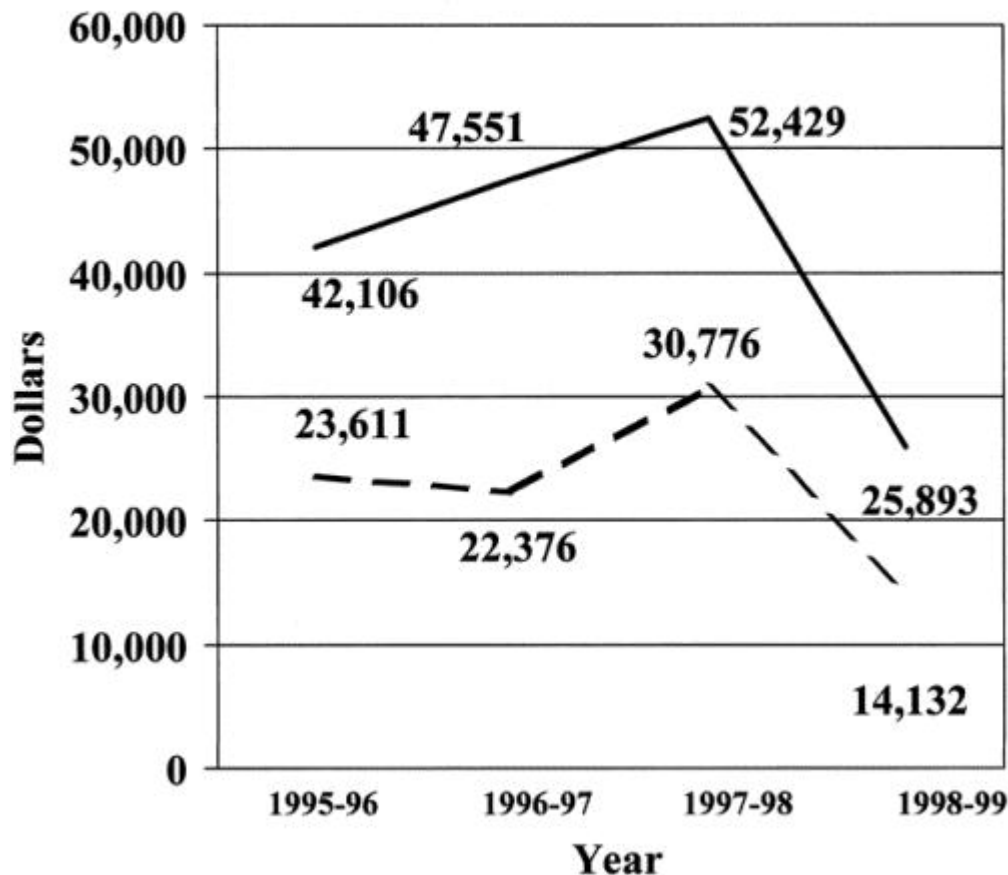


Fig. 2. Cost for photography services between 1995 and 1999. Total cost (*solid line*) includes six full-time attending physicians and six residents; 1998–1999 includes some use of digital imaging. Resident cost is indicated by a *dashed line*.

To financially justify the conversion, we began using a film recorder to prepare presentations for grand rounds, conferences, etc., thus avoiding costs of converting PowerPoint files to slides (\$5.20/slide). From August of 1998 to June of 1999, we produced almost 1400 slides at a cost of \$750 for film and processing. Estimated photography charges for identical services based on their prices approached \$7500. The overall saving was \$6750. This far exceeded in less than 1 year the cost of the hardware needed to perform this task.

Next, our proposal focused on resident clinical photography. From prior records, we estimated that residents shoot on average 2.5 rolls of 36-exposure slide film per week, at a weekly cost of \$40 and a yearly cost of \$2000 per resident. This totals \$12,000 for the six residents. Taking into account the costs of presentations over the previous year as mentioned above (\$7500), this amounts to \$19,500 of costs for photography services. The first-year cost analysis is presented in [Table I](#).

To exemplify the financial savings over a period of time, we showed the cost analysis over 5 years (see [Table II](#)).

TABLE I
Cost Analysis at 1 Year for Buyout Option

Estimated savings*	\$19,500	
Cost		
Digital camera for each fellow	\$ 6,000	(1,000 per camera)
Hard drive or additional film card	\$ 1,200	(\$200 per unit)
Laptop computer	\$ 3,431	
LCD projector	\$ 5,525	
Total cost	\$16,156	
1st year savings	\$ 3,344	

* Based on \$7,500 presentation costs and \$12,000 clinical photography costs.

Table 1. Cost Analysis at 1 Year for Buyout Option* Based on \$7,500 presentation costs and \$12,000 clinical photography costs.

TABLE II
Cost Analysis 5-Year Projection for Buyout Option

Year	1	2	3	4	5	Totals
Current expense	\$19,500	\$19,500	\$19,500	\$19,500	\$19,500	\$97,500
Proposed expense	\$16,156	\$ 3,600	\$ 3,600	\$ 6,600*	\$ 3,600	\$33,556
Variance (savings)	\$ 3,344	\$15,900	\$15,900	\$12,900*	\$15,900	\$63,950

* Cost includes new laptop computer for hardware upgrade.

Table 2. Cost Analysis 5-Year Projection for Buyout Option* Cost includes new laptop computer for hardware upgrade.

The Equipment

The equipment necessary for this conversion is listed in [Table III](#). Prices listed are all estimates at the time of this writing.

TABLE III
Equipment

Item	Estimated Cost
Digital camera*	\$1000
Film card 80 megabytes (200 pictures)	\$ 180
PCMCIA adapter	\$ 40
PCMCIA card reader	\$ 75
Laptop computer†	\$3500
LCD projector‡	\$5500
Hard disk drive 18-gigabyte IDE	\$ 200

* Cost includes 8-megabyte film card, PCMCIA adapter, AC power cord, and card reader.

† 400-MHz Pentium II processor, 128 megabytes of RAM, internal ZIP drive, DVD, port replicator.

‡ XGA resolution (1024 × 768), 800 ANSI Lumens, 10 pounds.

Table 3. Equipment* Cost includes 8-megabyte film card, PCMCIA adapter, AC power cord, and card reader.† 400-MHz Pentium II processor, 128 megabytes of RAM, internal ZIP drive, DVD, port replicator.‡ XGA resolution (1024 × 768), 800 ANSI Lumens, 10 pounds.

Digital Camera

We examined several manufacturers of digital cameras with resolution in the 1.5 to 2.3 megapixel range. We also required a built-in macro capability and features allowing adjustable metering such as shutter or aperture priority. The cameras also have different quality settings, allowing for greater storage capacity on the film card. Price range for our use was \$700 to \$1400.

Film Card

Film for digital cameras comes in different formats, depending on the manufacturer of the film. The most common are flash card and memory sticks. They also range in their storage capacity from 4 to 320 megabytes. Affordable film generally falls in the range of 8 to 80 megabytes. Typically, an 8-megabyte film card can be reused 1 million times and holds an average of 20 pictures at medium quality (third-best quality, second-least compression of picture). A 32-megabyte card (holding 80 medium quality pictures) ranged from \$80 to \$100.

PCMCIA Adapter

PCMCIA technology is an industry standard designed for laptop expandability. The adapter generally has a slot available in which to place the film card and slides into

a laptop PCMCIA slot or PCMCIA card reader (see below) to allow transfer of the digital images into the computer. The adapter was priced at \$30 to \$50.

PCMCIA Card Reader

PCMCIA card readers are designed for desktop computers (which typically are without PCMCIA card slots) to import digital images. It connects to desktop computers via parallel port or SCSI connection and was priced at \$70 to \$100.

Laptop Computer

A laptop computer is necessary to allow portability when giving presentations via the LCD projector (see below). It is also used in clinics for importing digital images into databases immediately and then transferring them to a physician's database later by local network or portable storage media such as Zip disk or CD-ROM. We required a 366-MHz Pentium II processor, 128 megabytes of RAM, a 6-gigabyte hard drive, an internal ZIP drive, a DVD drive, a port replicator, and a 15-inch screen for easy viewing; laptops with these specifications were priced at \$3300 to \$3500.

LCD Projector

An LCD projector projects dynamic capable presentations from the computer for the audience; it also allows computer instruction and the ability to incorporate motion video and sound into presentations. Projectors vary on resolution of projection, brightness of projector bulb, portability, and extra features. We required XGA resolution (1024 × 768), projection up to 50 feet, remote operation, and lightweight portability. LCD projectors were priced at \$4000 to \$8000, based on the variables mentioned.

Hard Disk Drive

A standard IDE hard disk drive with 10.0 gigabytes is dedicated to storing clinical images. Hard disks were added to the desktop computers either at the resident's home or in the hospital.

We examined several digital cameras for the proposal and allowed the residents to agree upon one model with the stipulation that they must be priced under \$1000. All of the models we examined were shipped with an 8-megabyte film card, PCMCIA adapter, and PCMCIA card reader for importation of the digital images into desktop models. The PCMCIA adapter allows direct importation of images into a laptop computer with an available PCMCIA slot (standard on all laptops).

We purchased six digital cameras (roughly \$1000 each) for each of the residents. In addition, we allowed the residents to choose between receiving a hard drive (10 gigabytes) dedicated to storing their images or a larger film card (80 megabytes) for more immediate storage capacity. The amount allocated to this expenditure was \$200 for each resident.

We examined three approaches to purchasing the equipment: a buyout option (purchasing all equipment up front), a lease option (true 3-year lease of laptop computer (\$128/month) and 3-year lease of LCD projector (\$192/month) with \$1

buyout), and buyout/lease option (buy laptop and 3-year lease LCD projector with \$1 buyout). After thoroughly analyzing the options, we chose the buyout option.

As shown in [Table III](#), we project that by the end of the first year, we will have saved \$3344. By the fifth year, savings will total \$63,900. The increase in spending during the fourth year from the expected \$3600 to \$6600 is attributable to the purchase of a new laptop computer, budgeting for a hardware upgrade. Each year, the three new residents entering the program will receive a digital camera and hard drive or additional film card. The exiting residents will keep their digital cameras, ensuring that we remain up to date with digital photography technology. This would save an additional \$3300/year (excluding upgrading costs every 2 to 3 years) for practices without rotating residents ([Fig. 1](#)).

Advantages to Digital Photography

There are numerous advantages for converting to digital photography ([Table IV](#)). Contributing to the financial savings are no recurrent costs for film, processing, and storage. Perhaps one of the greatest benefits is the organization of photographs into a database. Photographs can be managed with low-cost software for database archiving, which allows labeling of individual photographs with demographic information such as patient's name and medical record number, as well as procedure performed and diagnosis. This labeling allows the database to be searched for criteria such as procedures, diagnoses, age groups, etc. Retrieval is fast and easy to perform. Database organization also allows secretarial staff access to patient photographs for communication with insurance companies, other physicians, etc.

TABLE IV
Advantages of Digital Photography

Database organization: easy, fast retrieval; search capabilities
Permanency of photos
Immediate review
No film cost (reusable media)
No processing cost
Easily transportable
Digital images accepted for board certification
Digital editing and labeling
Easy conversion to other formats: prints, 35-mm slides, or negatives
Easy integration into other applications
Multiple copies created without cost
Easily transmittable over the Internet

Table 4. Advantages of Digital Photography

With the exception of Kodachrome, photographic slide film loses quality over time by chemical degradation. Digital imaging retains archival quality indefinitely. Multiple copies can be created without additional cost. This is especially useful in a teaching institution, where photodocumentation for the patient of a fellow or resident frequently leaves the institution with the departing fellow, making patient follow-up difficult if not impossible to adequately assess.

Digital photography allows immediate review on the camera's LCD display, ensuring quality photographs under changing lighting conditions, such as in the operating room. It also eliminates any possibility of processing problems, mechanical failure, exposure issues, or lost film. In addition, it provides an immediate tool for patient education in regard to surgical planning or consultation. It also allows immediate communication with other consultants, physicians, and insurance companies (by means of attachment to e-mail over the Internet) or inclusion through printing in the official patient record.

Transportation of slides, photographs, and presentations can be easily accomplished with compact storage media such as floppy disks, ZIP disks, or CD-ROMs. This eliminates the need for transporting multiple slide carousels or slide cases.

Digital images are easily integrated into other applications, such as word-processing programs, presentation programs (i.e., PowerPoint), computer simulation software (i.e., Mirror), e-mail applications, or graphic editing, layout, and design software (i.e., Adobe PhotoShop). Color digital images can also be converted to black and white with the aid of image software at the click of a button. Contrast and brightness can be adjusted to improve photograph quality with most digital-editing software. Digital images can also be easily digitally labeled onto the photograph in most digital-imaging software. With the addition of a color printer or film recorder, digital images can be printed to paper, photopaper, and 35-mm film, respectively. Lastly, digital images are easily integrated into Internet web sites for display.

At the advent of digital photography, cost of equipment and poor resolution of images were initially prohibitive to incorporating digital photography into a plastic surgical practice. However, prices for equipment have dramatically dropped as resolution of photographs as greatly increased, making digital photography a realistic alternative. In fact, resolution has improved so much that the American Board of Plastic Surgery is now accepting digital photography for board certification. There are still some disadvantages to digital photography. First, there is a small learning curve to overcome, as with any new technology. Many companies have succeeded in making their digital cameras easy to use and operate. Second, all data must be continually backed up to prevent accidental data loss. We back up data on a weekly basis via a tape back-up unit. Lastly, there is no "hard copy" of a photograph to be handled unless one is created by printing to paper or film. This last disadvantage seems to be difficult for some to accept.

However, as we move further into the digital age, we will learn to rely less on hard copies of information and more on the digital data.

Summary

With the advances in digital photography technology, it is now realistic to incorporate digital imaging into plastic surgery. In fact, we have shown that for a multi-physician practice in an academic center, the conversion to digital photography from conventional photography is financially beneficial. This model can be used to exemplify the reasons for transition to digital for other practices. Digital photographic quality and price are no longer issues to prohibit conversion from conventional photography. As technology and computers impact more and more on our daily life, digital photography will not be just an alternative but the standard means of photodocumentation for the plastic surgeon. Although it may seem that we advocate tossing conventional 35-mm camera equipment away, we certainly do not. It is likely that in the future there will be digital conversion attachments to conventional camera equipment at reasonable costs.

We have integrated digital photography not only for the reasons mentioned above but also because it allows us to be more academically productive; we can document clinical results, organize these results, review and analyze them, track patients over time, and provide teaching. This not only improves our ability to provide a better clinical outcome, it also allows better research and education.

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Photographic Standards in Plastic Surgery

[Special Topic]

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Abstract

Standard photographic technique in plastic surgery is an important topic that has been stressed in the discipline over the past several years. Clinical photographs should always be taken with the same camera lens, lens setting, lighting, film, and patient position to ensure reproducibility and to enable valid pre- and postoperative comparisons. A 35-mm single lens reflex camera is highly recommended for this type of photography. Two lenses are suggested, one with a focal length range of 50 to 60 mm and one with a focal length range of 90 to 105 mm. Both should have macro capability. Two or more flash units are recommended, either camera-mounted or a studio system set-up in the office. Using the patient preparation method and technique outlined in the text, the Standards in Clinical Photography achieve consistency from patient to patient and also in the same patient in pre- and postoperative photographs. Henceforth, the information discussed in the article forms the basis for standard views, regardless of the image-capture medium.

The importance of a standard photographic technique in plastic surgery has been much discussed and stressed in the discipline over the past several years. In 1991, through the efforts of the Clinical Photography Committee of the Plastic Surgery Educational Foundation, photographic standards in plastic surgery were agreed upon.¹ The venues for dissemination of this information had been study courses and a laminated card under the same title. Although the information is available in this form to members of the American Society of Plastic and Reconstructive Surgeons, a published definitive article on this subject is warranted.

There have been numerous publications on subtopics in clinical photography.²⁻⁶ Clinical photographs should be taken with the same camera lens, lens setting, lighting, film, and patient position to ensure reproducibility and to enable valid

pre- and postoperative comparisons. We photographed our model using specific anatomic landmarks as guides for positioning each pose. These landmarks should be used each time to ensure the exact duplication of poses.

Equipment

A 35-mm single lens reflex camera is highly recommended for clinical photography. There are several quality manufacturers that produce adequate equipment. Regardless of camera manufacturer, we highly recommend using a camera body that accepts a grid screen in its view finder (Fig. 1). The grid screen has horizontal and vertical lines etched into it, which are helpful when aligning patients within the camera viewfinder frame. This is the first step toward achieving complete consistency and reproducibility.

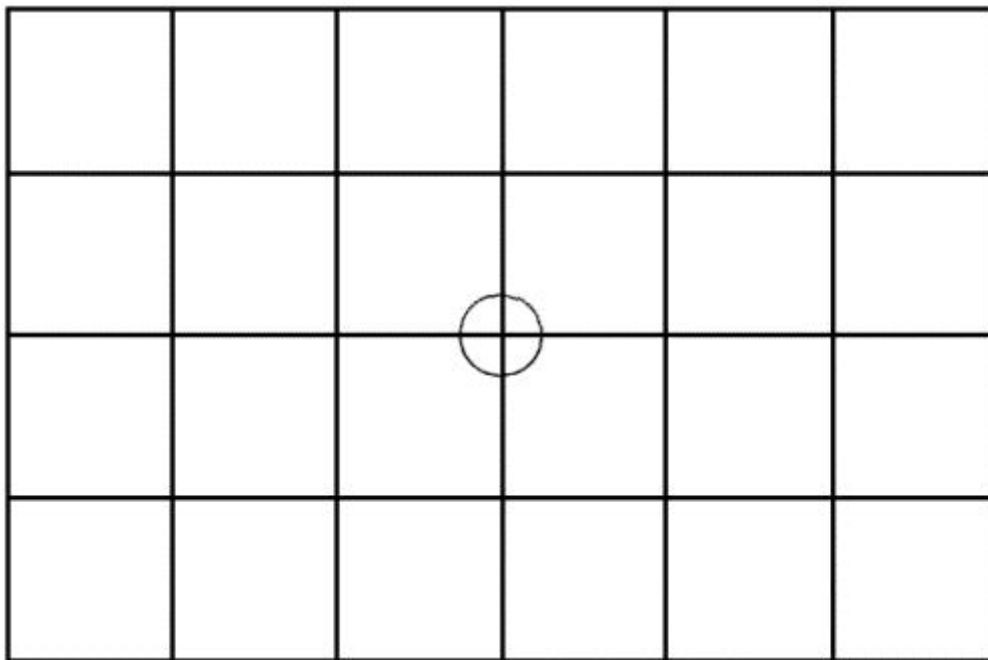


Fig. 1. Sample camera viewfinder grid screen.

We recommend having two lenses. One should be in the shorter focal length range of 50 to 60 mm and have macro capability. This lens is used primarily for body contouring and photographs that use a larger area. A lens with a longer focal length, in the range of 90 to 105 mm, again with macro capability, is recommended as well for closer photographs of the head. Lenses in this range also have a minimal amount of distortion, which creates a flat field and the most accurate depiction of the subject's face.

Macro lenses typically have a focal range that includes feet, meters, and a reproduction ratio. Focusing techniques as indicated in the figure legends use a particular reproduction ratio for reproducibility of the subjects.

Lighting

We recommend having two or more flash units, either camera-mounted or set up as a studio system in the office. Having two main lights at 45-degree angles to the subject is most important. Additional lighting, if possible, should include background lights approximately 3 feet from the background, again at 45-degree angles (Fig. 2). Whereas the main lights provide even illumination without shadows on the subject, the background lights eliminate shadows in the background. Several manufacturers produce quality units for such purposes. A power of 250 watt-seconds is adequate for the main lights. Background lights can use markedly lower power, which lowers the cost. Many of these units have built-in slave units, which allow the flash units to trip without direct wire connection. Some have built-in slave units that react to the light output of one main flash. It is also beneficial to place a soft box in front of the main light units or to reflect them indirectly using a photographic umbrella. Both of these techniques allow for soft lighting of the subject.

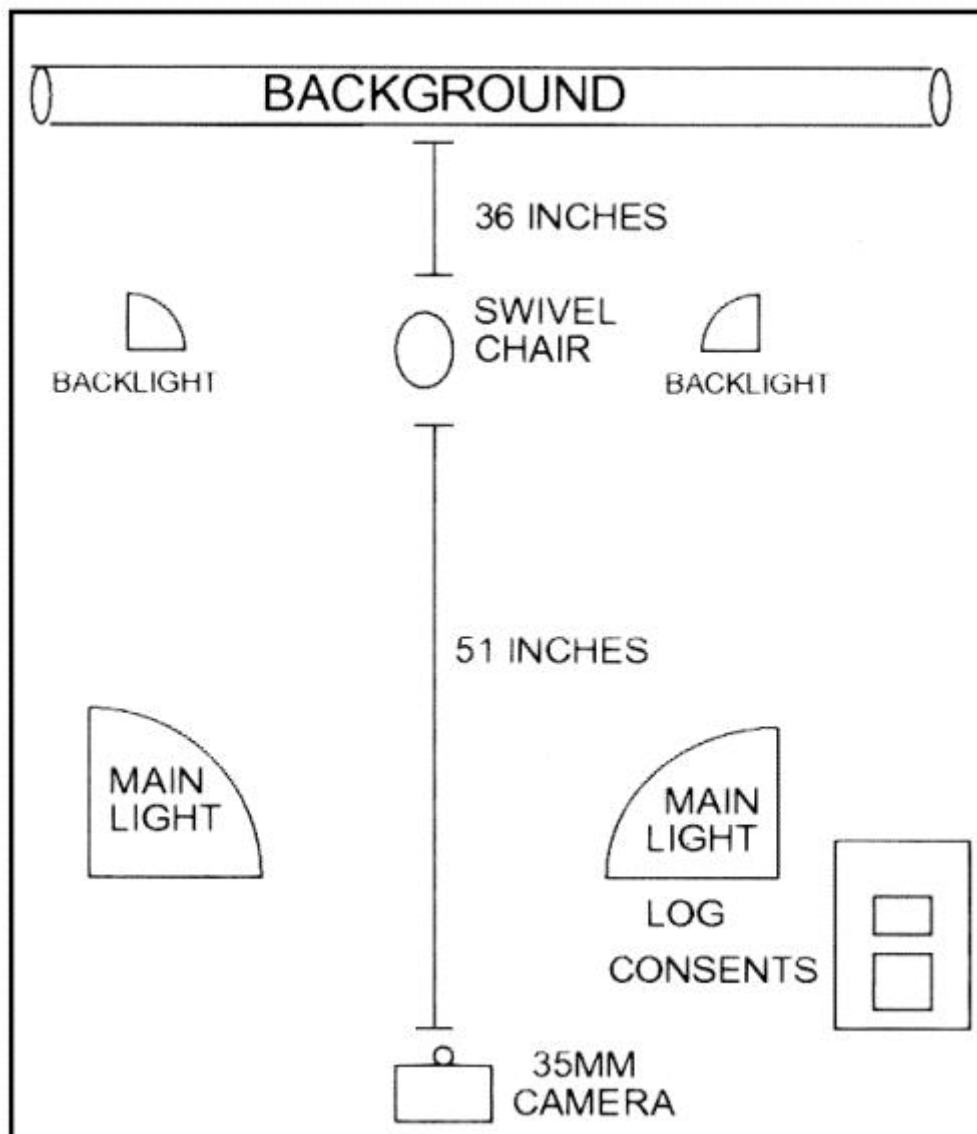


Fig. 2. Lighting diagram.

When a single flash unit is used on the camera, many of the flash exposure settings can be determined automatically. When a several-light set-up is used, we recommend holding a flash meter in front of the subject. This measures the light falling on the subject from one or more flash units. The appropriate F-stop is read from the meter at a given ISO film speed. This information is then set as an F-stop on the camera lens. If the flash system and film speed remain the same, the settings need not be repeated.

Background

An even, uncluttered background directs the viewer to the subject. After multiple tests of different colors, the Clinical Photography Committee decided that a sky blue background was the most visually pleasing, whether in black and white or in color photographs. Some clinical photographers choose a black background because it eliminates shadows; however, background lights make shadows unobtrusive. Background paper can be purchased at better photography stores, with a common roll width of 4 or 8 feet. In addition, mounting hardware and photographic garments (otherwise known as "photo panties") can be purchased from several manufacturers. These are an alternative to patients' underwear, which can vary in appearance.

Accessories

We highly recommend using a camera tripod for stability. Because focusing is done by moving the camera back and forth, a tripod dolly is helpful and can be found at most video camera stores. If the lens is focused with its ring in a stationary camera position, the size of the subject within the frame will vary.

Because the position of the patient's eyes is important at times, it is helpful to place markers around the room. This allows the patient to move easily between the successive views. A logbook in the photographic room should record each patient by name. Finally, appropriate photographic consent forms should be ready for signing before any clinical photography is done.

Photographic consent forms may also include permission for nonmedical uses of the photographs, such as for marketing and promotional use. It is usually recommended, however, that a separate specific consent form be used for these purposes.

Film

Clinical photographs can be taken with color slide film or black and white or color print film. Since the 1930s the color slide film of choice has been Kodachrome 64 (Eastman Kodak, Rochester, N.Y.). The disadvantage, however, is that this film can only be processed at a limited number of photographic laboratories across the country. Many are afraid that they will lose their clinical photographs in the mail. An alternative is a film like Ektachrome (Eastman Kodak), which can be developed using the widely available E-6 process available at most local photographic

laboratories across the country. Recently, other quality manufacturers, such as Fuji (Elmsford, N.Y.), have developed excellent color slide films, such as Previa and Velvia (Fuji) using the E-6 process.

Patient Preparation

Face

Hair should be pulled off of the face and placed behind the ears. A supply of hair clips to assist with controlling the hair is helpful. Distracting jewelry, such as earrings and necklaces, should be removed. Eyeglasses should be removed as well. Makeup is acceptable if not overdone. However, if the upcoming procedure is for a preoperative skin problem requiring dermabrasion or a laser or chemical peel, all makeup should be removed.

Torso

Gown and clothing should be removed completely. Pendants around the neck should be either removed or turned to the back. The patient should wear a photo garment when applicable (available from Byron Medical, Tucson, Ariz.).

Hand

Move hands away from the background. Any rings or shirt sleeves should be out of the frame of view.

Lower Extremity

The background should be placed onto the floor so that the patient can step onto the background without the view of any flooring appearing in the photograph.

Technique

1. Establish anatomic landmarks to be included in each view.
2. Determine subject distance from camera lens (or reproduction ratio) to fill the picture frame with these landmarks.
3. Adjust position of subject to standard reproducible position using anatomic landmarks.
4. Set lens at the same level as the area being photographed.
5. Frame the subject with the grid screen to ensure consistent positioning of the patient within the field of view.
6. Move with the camera to bring a particular focal point into focus.

Illustrations of each view with technical data are demonstrated ([Figs. 3 through 14](#)).

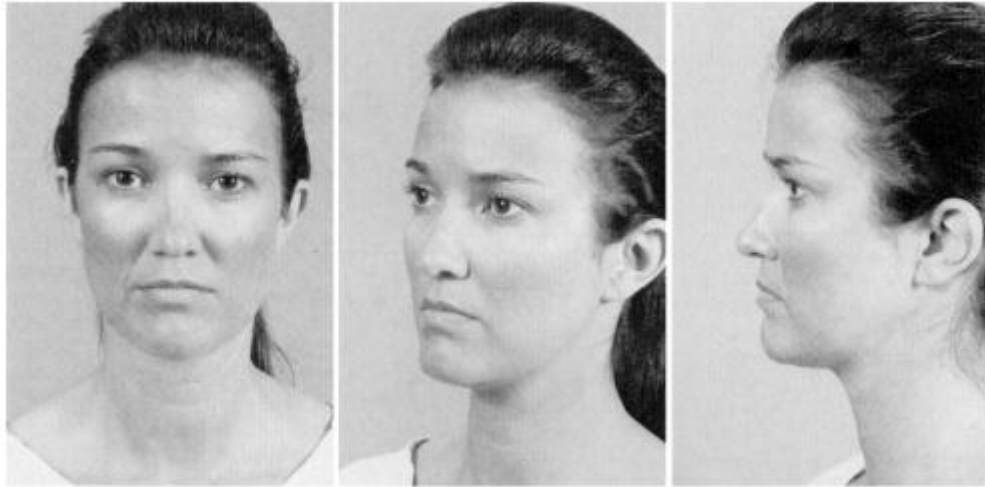


Fig. 3. Face. Lens: 90 to 105 mm; distance: 38 inches; reproduction ratio: 1:9. The camera should be oriented vertically. Anatomic landmarks are as follows: Front view: above the top of the head to include the clavicular head, eyes looking into the camera (*left*). Oblique view: rotate the patient (feet and shoulders) to place the nasion at a distal medial canthus, eyes straight ahead (*center*). Lateral view: rotate the patient until the philtral columns are aligned, no head tilt, eyes straight ahead (*right*). Focal point: nearest eye's lashes.

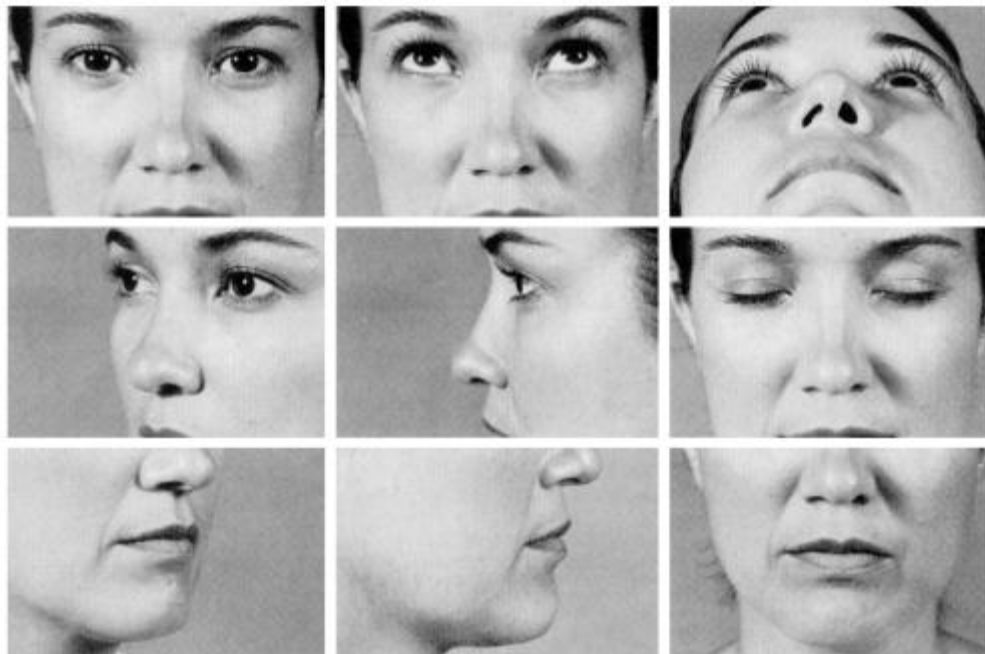


Fig. 4. Closeup of the face. Lens: 90 to 105 mm; distance: 21 inches; reproduction ratio: 1:4. Orient camera horizontally. Anatomic landmarks are as follows: Eyes/nose: eyebrows to upper lip (*above, left to right*). Basal view: tip of nose aligned with upper eyelid crease (*center, left to right*). Mouth: include nasal tip

and chin (*below, left to right*). Patient position and landmarks are the same as for full-face views. Focal point: lashes or lip.

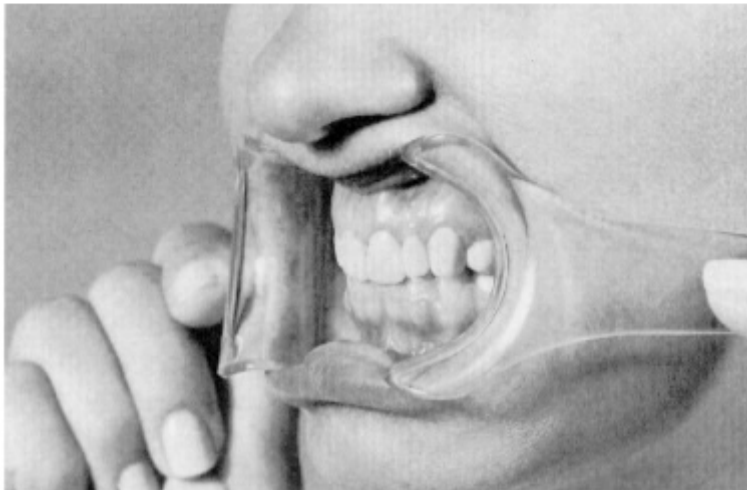
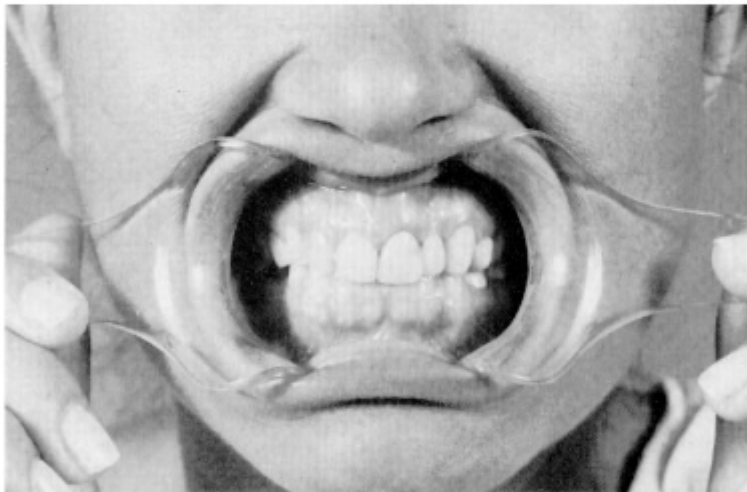
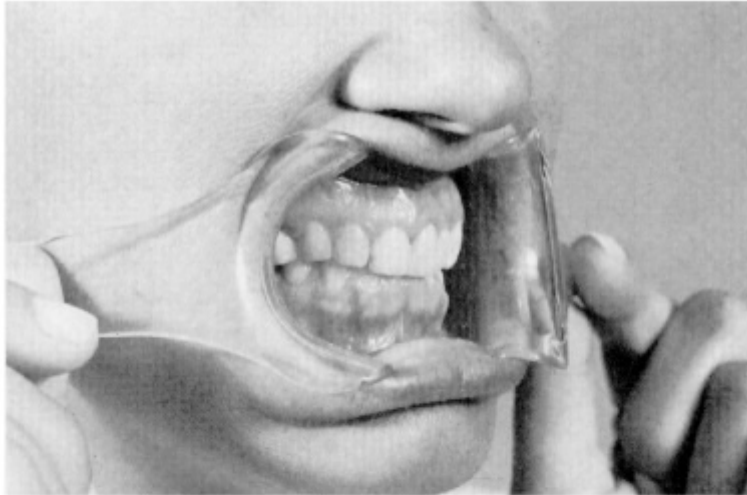


Fig. 5. Teeth. The ring flash should be used.

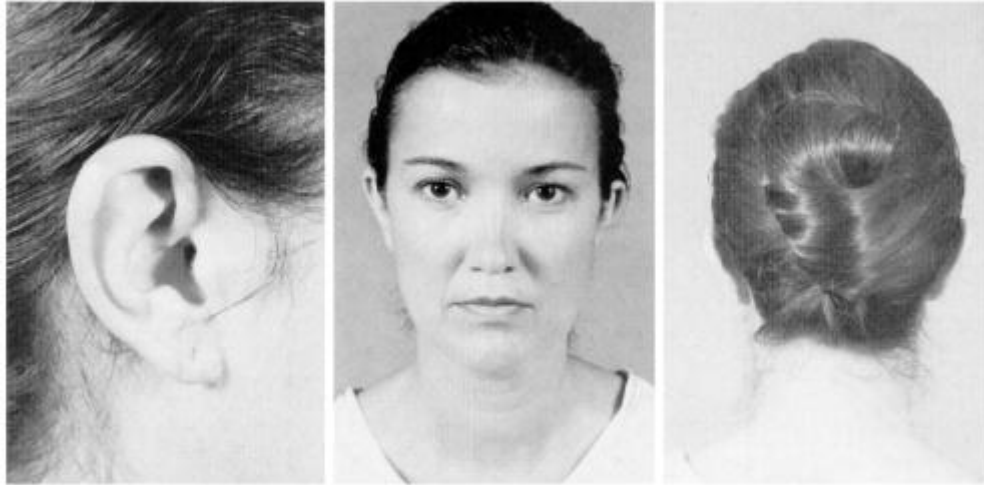


Fig. 6. Ear. Lens: 90 to 105 mm; distance: 19 inches; reproduction ratio: 1:3 (1:9 for anterior and posterior views). Orient camera vertically for closeup (*left*) and anterior (*center*) and posterior (*right*) head views.

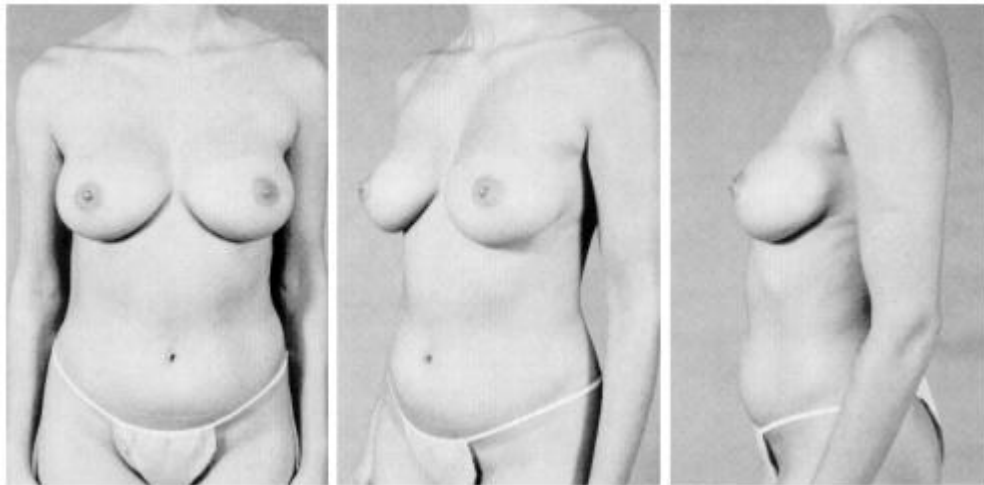


Fig. 7. TRAM. Lens: 50 to 60 mm; distance: 3 feet; reproduction ratio: 1:12. Orient camera vertically. Anatomic landmarks: Front view: include clavicles and shoulders above, pubis below, arms at side (*left*). Oblique view: turn patient 45 degrees, move distal arm back slightly (*center*). Focal point: umbilicus.

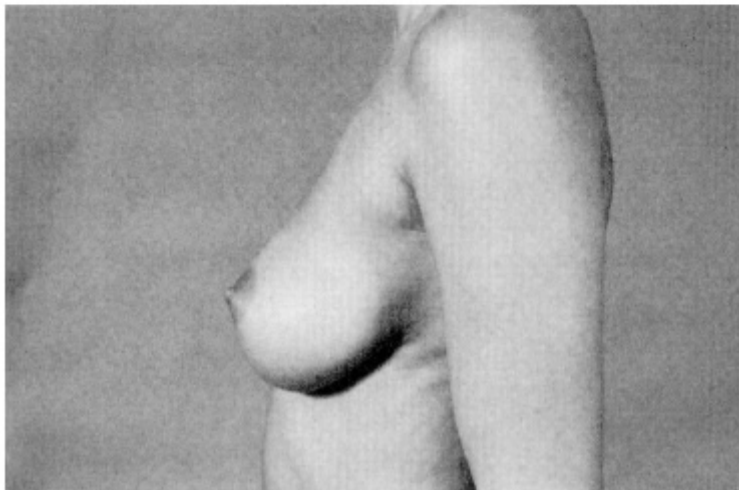
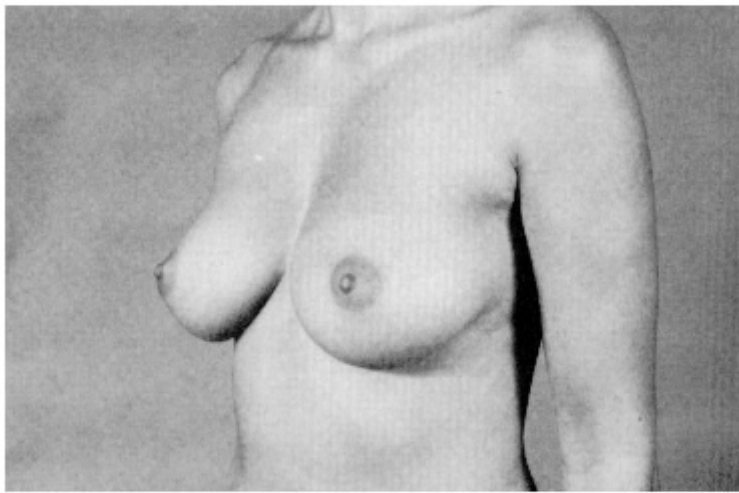
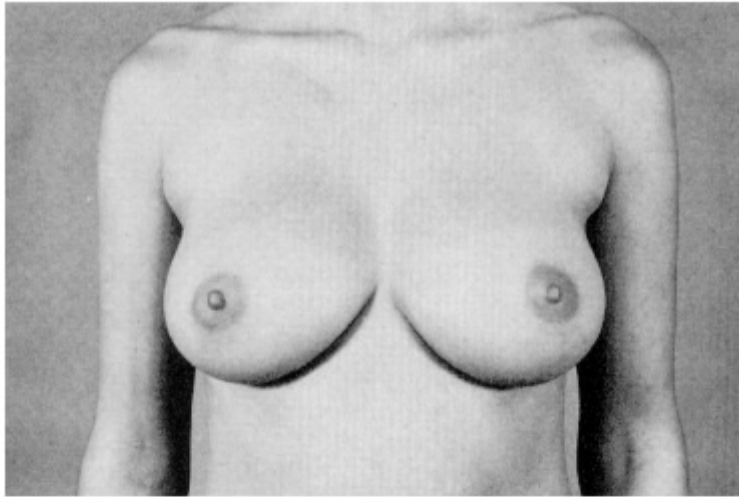


Fig. 8. Breast. Lens: 50 mm; distance: 3 feet; reproduction ratio: 1:12. Orient camera horizontally. Anatomic landmarks: Front view: include clavicles and shoulders, arms at side (*above*). Oblique view: turn patient 45 degrees and move distal arm back slightly (*center*). Focal point: nearest nipple.

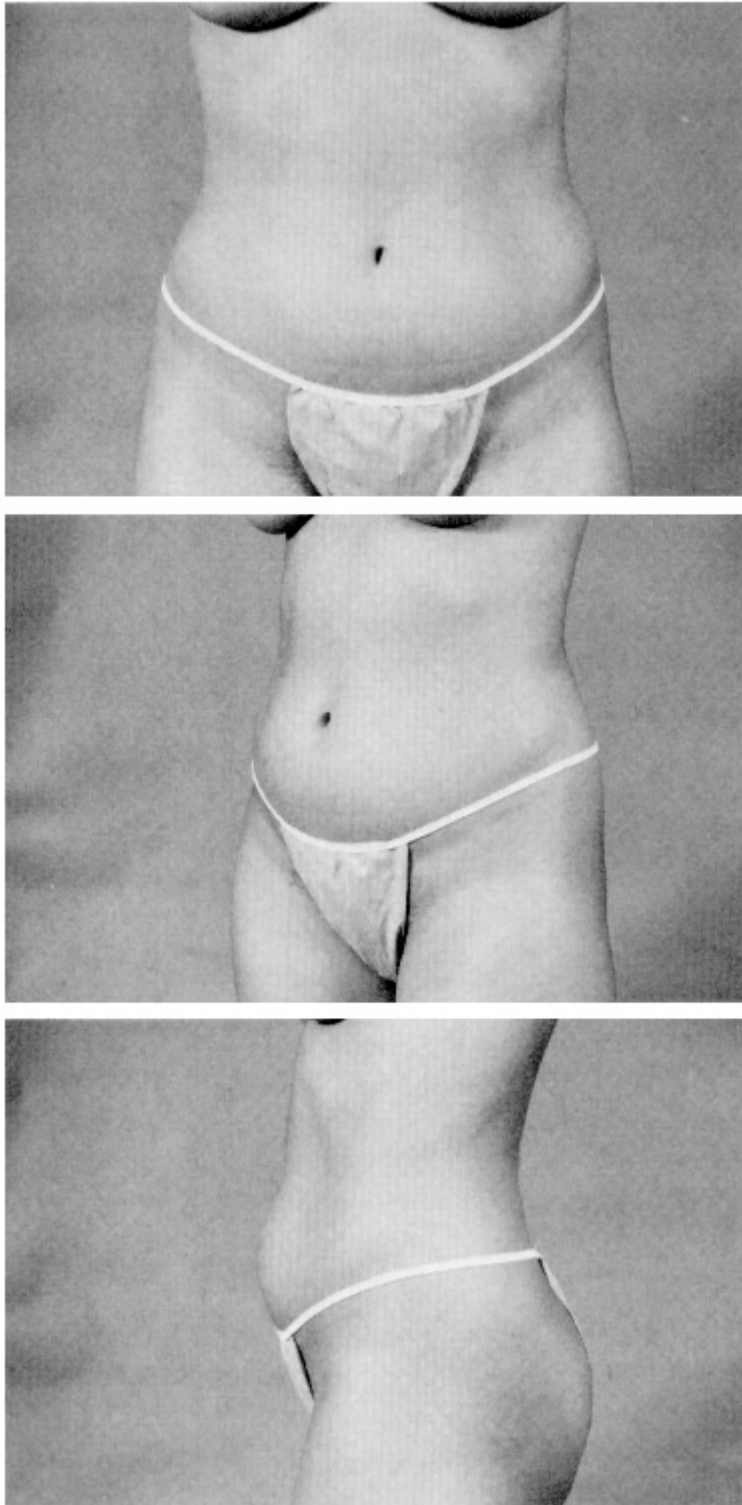


Fig. 9. Abdomen. Lens: 50 to 60 mm; distance: 3 feet; reproduction ratio: 1:12. Orient camera horizontally. Anatomic landmarks: Front view: inframammary fold

to upper thigh, arms folded above breasts (*above*). Oblique view: turn patient 45 degrees (*center*). Focal point: umbilicus.

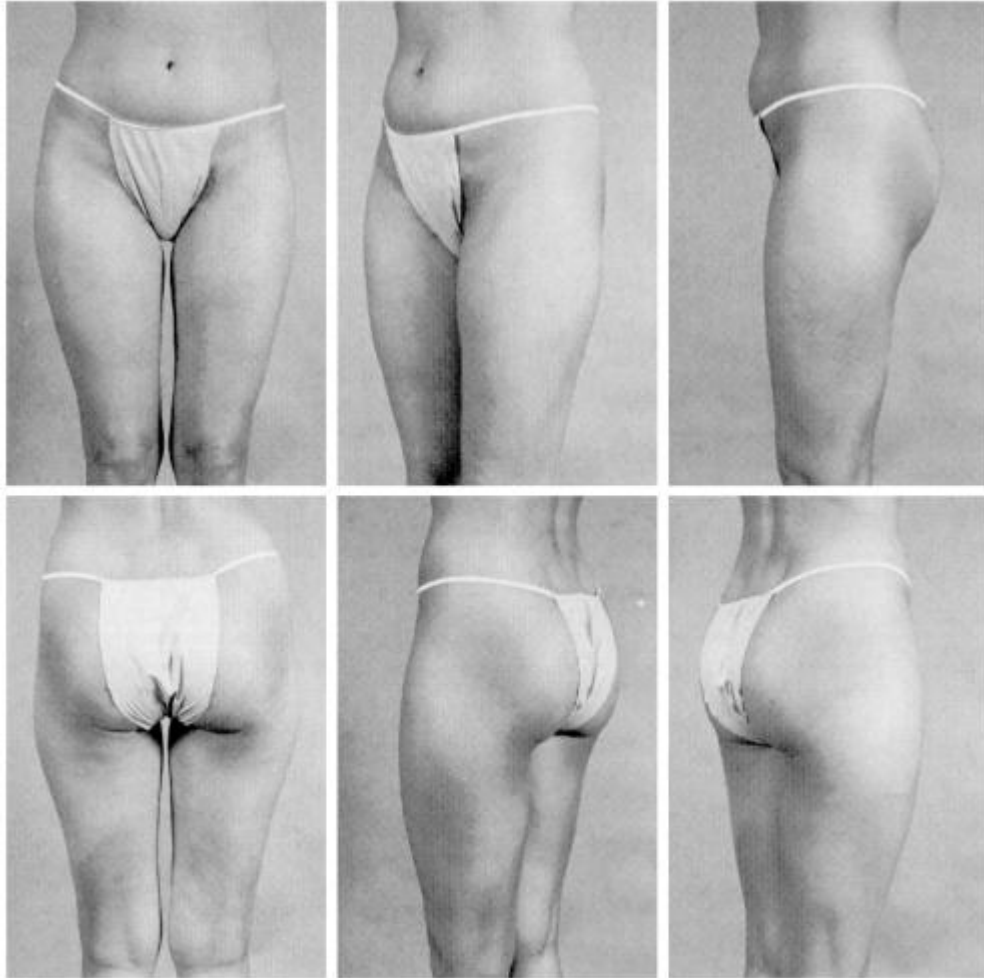


Fig. 10. Hip/thigh. Lens: 50 to 60 mm; distance: 3 feet; reproduction ratio: 1:12. Orient camera vertically. Anatomic landmarks: above umbilicus to below knees, arms folded above breasts, feet apart to show full contours of medial thighs. Focal point: photographic garment.

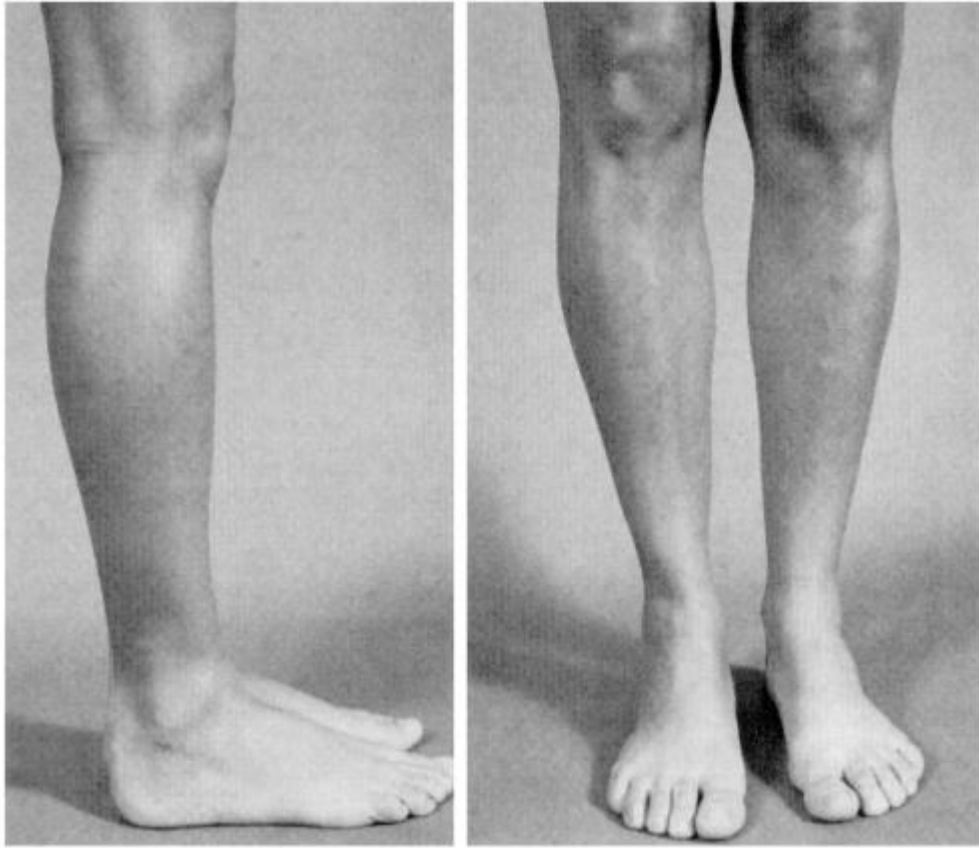


Fig. 11. Leg/foot. Lens: 50 to 60 mm; distance: 3 feet; reproduction ratio: 1:12. Orient camera vertically. Anatomic landmarks: above the knees to below the feet. Focal point: knee.

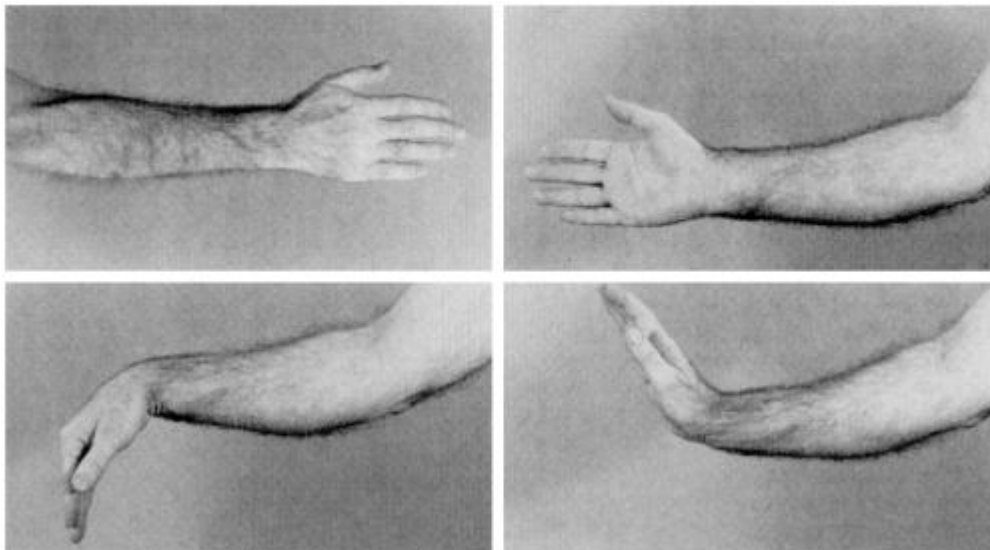


Fig. 12. Forearm. Lens: 90 to 105 mm; distance: 5.5 feet; reproduction ratio:

1:11. Orient camera horizontally. Anatomic landmarks: elbow and fingertips should be included.

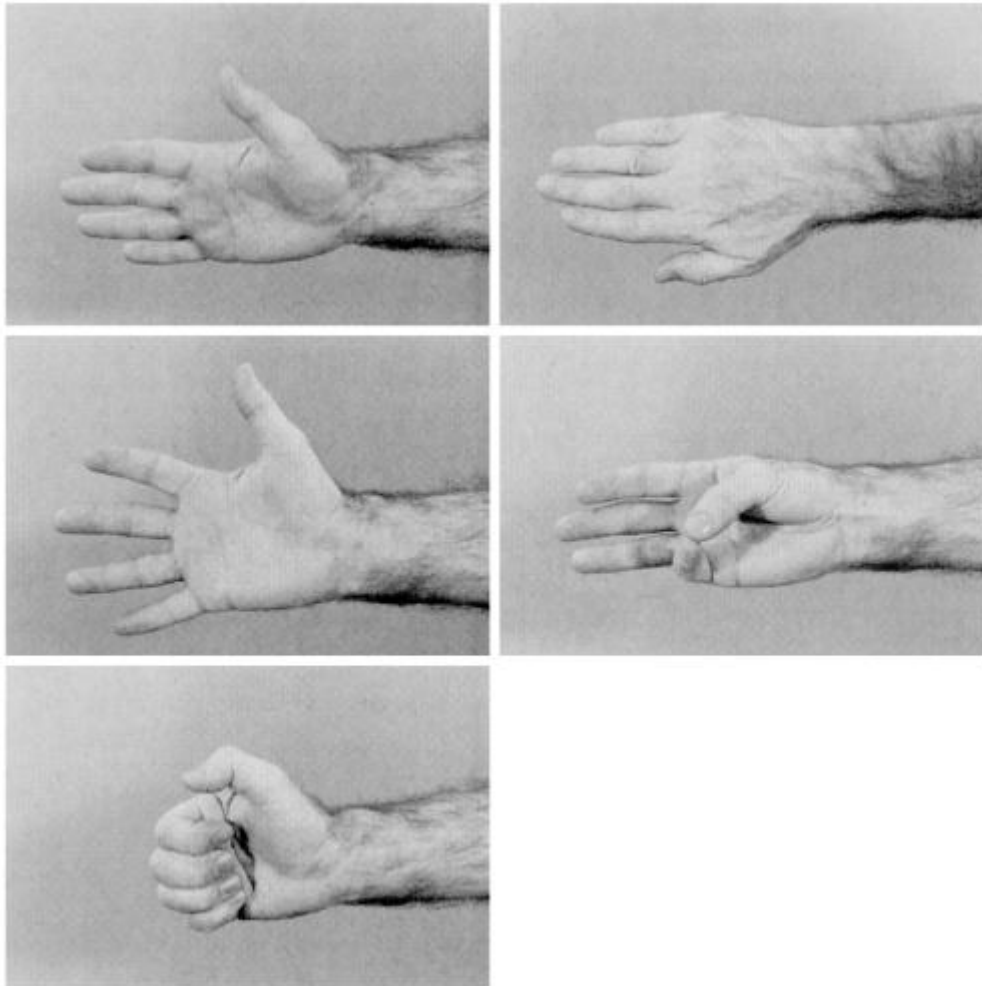


Fig. 13. Hand. Lens: 100 to 105 mm; distance: 3.5 feet; reproduction ratio: 1:5. Orient camera horizontally. Anatomic landmarks: wrist should be included with hand.

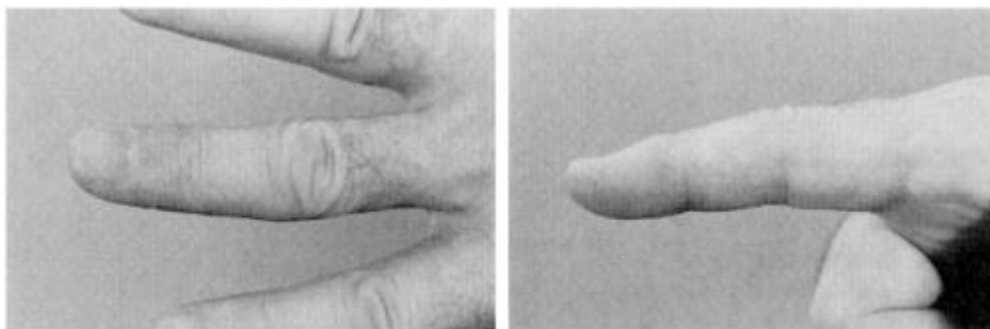


Fig. 14. Finger. Lens: 90 to 105 mm; distance: 20 inches; reproduction ratio: 1:11. Orient camera horizontally. Anatomic landmarks: fingertip and metacarpophalangeal joint.

In addition to the aforementioned steps to obtain the photograph, the patient's name and other data should be recorded in the photographic logbook. The patient should be asked to sign a photographic consent form. Lighting should be turned on, and flash height position and settings should be verified. On the camera itself, the appropriate shutter speed and F-stop should be checked before each use. The film speed of the selected film should be set on the camera or flash meter. The camera should be oriented appropriately.

Discussion

The aforementioned standards, when used in clinical photography, achieve consistency from patient to patient and also in the same patient in pre- and postoperative photographs. These techniques also help to achieve a level of quality within the photographs, and they form the basis for standard views, regardless of the image-capture medium. The recommended views are those used in the clinical photography of the more common types of plastic and reconstructive surgical practice. Specialty procedures, such as liposuction, and those for the skin, hair and scalp, require special expertise in photography, and instructions can be found in other writings.⁷⁻¹¹

Future technology will transform the medium used to capture images from standard film to electronic sources. Over the past 100 years, changes in silver particles (silver halide images) have been the basis of film preservation. This medium has its advantages and disadvantages; at this point in time, it creates the sharpest images available to us. However, it lacks permanency in that colors fade with time. Digital imaging, which will be the image-capture technology of the future, uses computers to capture, store, and manipulate images. Although storage categorization and retrieval are enhanced with this method, the ability to change and distort images is also present. For this reason, visible codes or markers on manipulated images should be obvious to alert viewers to this change. It is paramount that the manufacturers of such software and equipment maintain such standards in the future.

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Digital Photography for the Plastic Surgeon

[Special Topic]

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Chemical emulsions have been the mainstay of photography for decades and, therefore, have been the backbone of clinical photodocumentation. Digital media, however, have been improving and the price tag falling. It is only a matter of time before the plastic surgeon must seriously consider the purchase of a digital system. Conceptually, the distinguishing factor differentiating digital from chemical-based imaging is the medium. In the case of digital imaging, the image is reduced to digital code readable by a computer, whereas with a chemical system, the image is rendered via a light-sensitive chemical reaction on the surface of film.

Digital imaging offers a number of benefits when compared with slide imaging; perhaps the one most easily seen is retrieval. Traditional slide images are bulky, often requiring out-of-office storage under specialized conditions. As the majority of slide images taken are of E6 chemistry, these images are not archival in their own right. Storage in a cold, dark environment is necessary to limit chemical dye degradation of the slide images. Still, noticeable degradation occurs over 1 to 2 decades. In rendering images digitally, the images last as long as the storage media upon which they are recorded. There is no degradation, as occurs with the chemical dye. The digital image, when needed, can be displayed via a computer screen or printed. Printed copies can be supplied to insurance companies, attorneys, and patients at a fraction of the cost and time of ordering prints from slides.

The cost of film and developing is eliminated with digital photography, and storage is reduced markedly, as the space needed is reduced significantly. In many cases, in-office storage may be possible with digital photographs, whereas it might not be using conventional chemical media.

Digital cameras use arrays of charge-coupled devices (CCD) to measure light levels. An arrangement of filters over a series of CCD arrays completes the color computation (red, green, and blue) and allows the depiction of a color image. Digital image resolution still lags well behind that available with conventional film. Whereas on 35 mm film, more than 100 million pixels (or points of light with a uniform color) are captured, a fairly high-quality digital camera at present can capture just over 1 million (at 1000 × 1280 resolution). Much higher resolution digital units are available, but these may take from 15 seconds to several minutes

to capture an image. Clearly, long exposures such as these are not practical in everyday clinical photography.

The image taken with the digital camera is processed through a computer and stored or printed. It is also in a convenient form to be automatically included with the patient's chart in database form. Retrieval of images, therefore, can be as simple as an in-office computer search. Likewise, the image can be routed to any of a number of slide-making programs or presentation aids for use in teaching and consultations with other physicians or publications (Fig. 1). A summary of a digital imaging system is provided in Figure 2. Each of the components will be discussed in detail below.

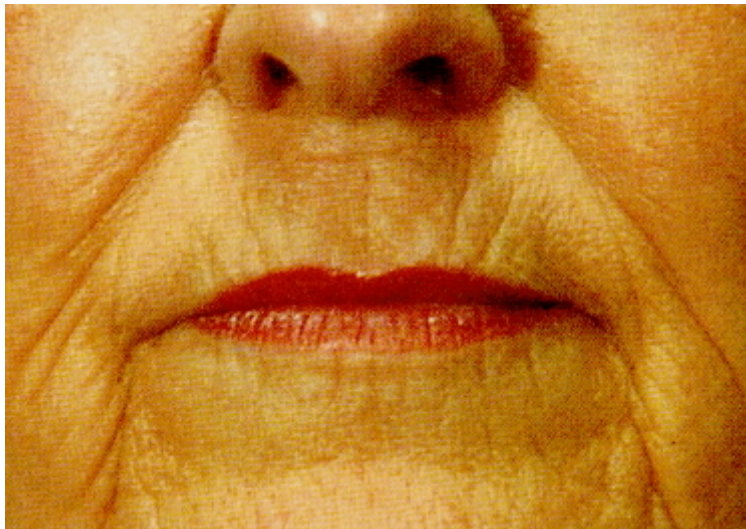


Fig. 1. This illustration was created as a digital image using a color video camera (with digital signal processor) with 768×494 pixels.

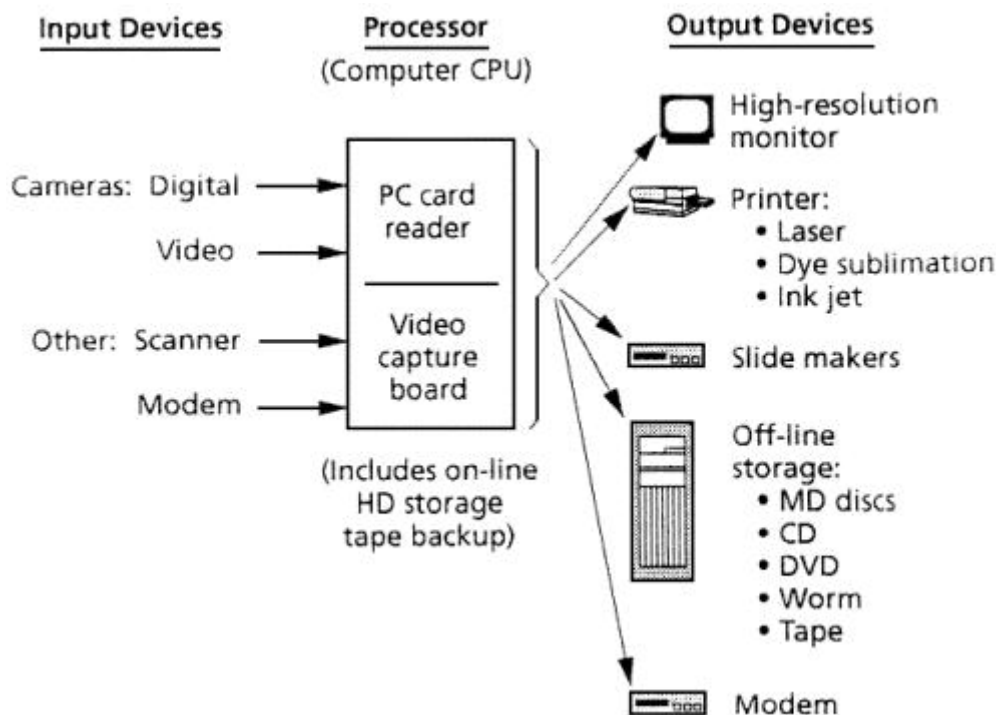


Fig. 2. Integrated Imaging System. The entire system includes: digital camera, computer, monitor, back-up, and printer, in the simplest case.

Equipment

The Camera

To be of use in clinical photography, a camera should offer at least 1 million pixel resolution, preferably with at least 24-bit color (16.7 million colors). This figure is not firmly established, and experts will argue. Suffice it to say, one camera's 1-million-pixel image may be not higher quality than another's 600,000-pixel rendition. Factors such as image compression, lens quality, and on-board camera processing are important in determining the quality of the images produced in digital photography (Table I). A problem arises as to the degree to which any of these individual factors may affect overall image quality. There is no universally held belief at this juncture as to the ultimate combination here. This is a science in flux. Most units marketed toward the general consumer produce images at peak resolutions of 300,000 pixels with 8-bit color (256 colors). High-end digital cameras may cost from \$3000 to \$12,000, although, at the time of this writing, a single new unit was released by Kodak at a price below \$1000. The units designed for the general population are much less expensive.

Resolution: pixel array
Low: <400K
Medium: 400K–1M
High: >1M
Lens
Quality
Fixed versus interchangeable
Exposure
Automatic
Manual
Color/processing
CCD arrays
Image compression
Integrated software
Viewfinder
SLR
LCD panel
Image storage capacity
On-board
Removable
Flash
Present
Interface for others
Cost
Averaging \$450

CCD, charge-coupled device; LCD, liquid crystal display; SLR, single lens reflex.

TABLE I Checklist of Digital Camera Features

Digital cameras come with a variety of options worthy of discussion, including image capacity and removable storage. A camera with a capacity of no more than four images at high resolution is of little use. Different developers have addressed the issue in a number of ways. Some have put more memory in the camera unit itself, thereby increasing the on-board image capacity. A potentially more practical solution is the inclusion of removable storage (generally memory cards). Larger cards provide storage for more images of higher quality.

Most cameras come with a built-in flash unit. For use in studio portraits, an external flash synchronization port must be included to allow for the use of multiple lighting units. Liquid crystal display (LCD) viewing screens are becoming standard in camera design. These are quite useful in providing feedback for a particular image. Images that are not adequate are deleted and reshot.

The issue of power is a key element in camera selection, because these cameras consume battery power rapidly, especially during image viewing and flash photography. The capacity for a rechargeable power supply is useful both in operation, to reduce flash recharge times, and in convenience, to avoid the frequent need to replace batteries or recharge. Plastic surgeons may prefer cameras that can be used at 120 V AC.

The Computer

With the digital camera purchase comes an assortment of hardware purchases as well. A computer is necessary, of course, to process and view images. The ease of upgrade should be a key element in decision-making in all purchases involving the digital system. As in all technology-related areas, the classification of "state of the art" is fleeting. Count on your state of the art system being outdated in 6 months to a year. The state of the art IBM-compatible computer at present is based upon the Pentium-Pro Intel chip. Memory should be 32 megabytes or more, and a CD-ROM drive (preferably one that both reads and records) should be included. Fortunately, the storage of images is becoming more economical as prices for both hard drives and removable storage have decreased along with hardware in general. A 4-gigabyte hard drive should allow for ample space for current high-resolution images (at a tenth to a half megabyte each); however, a reliable back-up modality should be available. A system crash, although infrequent, can be catastrophic for the unprepared, making regular back-up (at least once a week) advisable. The simple tape drive back-up has been superseded several times since its inception. These clumsy older drives were noisy and slow, not to mention unreliable.

Back-Up and Archival Issues

Two separate forms of back-up should be considered: interval and archive. The interval back-up is the weekly (or daily) process by which new images and data are copied to duplicate media. For this purpose, a rewritable medium is needed, such as that of the removable hard drive or magneto-optical disk. The cartridges of the former have been rated stable for at least 5 years and the latter for at least 30 years. Each of these offers speed and media with a relatively inexpensive cost per megabyte stored. The removable hard drive cartridges can also double as a means for inexpensive data transfer (such as to an outside printer or colleague).

For archiving, the stability of the medium becomes more important. As mentioned above, magneto-optical storage has been rated as stable for 30 years or more, so it can be considered for archival purposes. A CD-ROM, however, might be a better choice as it is permanent, and recordable CD-ROM drive prices have just fallen below \$1000. Furthermore, the cost per megabyte stored on a CD-ROM is roughly half the cost of comparable storage on magneto-optical media. The preferred use of the CD-ROM would be recording the entire disk in one session to maximize compatibility with older hardware. It certainly provides a readily accessed archive, which at present offers storage of up to 650 megabytes per disk. Where Digital Versatile Disc (DVD) technology will figure into the storage equation remains to be

seen. This modality offers an amazing 4.7 gigabytes of storage, but applications are currently in development.

The Printer

Images in a digital system may be printed on regular monochrome laser printers, but more realistic output can be seen with ink jet or color laser printers. The latter units have again fallen in price and improved in quality but are still eight to ten times more expensive than ink jet printers. The "gold standard" of digital reproduction might be the dye-sublimation printer, which runs at roughly twice the cost of a color laser printer. Printed pages on the color laser printer cost a tenth of those on dye-sublimation pages.

Even high-end ink jet printers tend to produce more grainy, less saturated, color images, so a color laser printer may be an acceptable alternative. As the images your camera produces will likely be compressed as JPEG files, the speed of a color laser printer will depend on the presence of a JPEG compression driver. A printer with such a driver and 16 to 32 megabytes of memory will cost roughly \$7000 and print an average of three color pages per minute.

Digital images may be used with film recorders as well as slide makers. High-quality film recorders (4000 lines resolution) cost about \$4000 and can also serve as recorders for slide-making programs. Even higher quality recorders are available (8000 lines resolution) but at two to three times the price.

LCD Panels/Projectors

For those interested in cutting-edge technology, a brief introduction to LCD projection is in order. Film recorders allow the production of 35 mm slides for projection, but these images are static. Newer generation presentation programs, such as Microsoft's PowerPoint and Adobe's Persuasion, allow dynamic presentations with animated graphics and sound. LCD projectors allow these dynamic presentations to be displayed upon a viewing screen. The overall effect is quite impressive.

LCD projectors are composed of two main components: the panel and the light source. The panel is much like a laptop monitor in that it comes in both active and passive forms. The active form allows much more brilliant saturated color rendition than the passive form and is, therefore, preferable. When integrated with a light source, such as an overhead projector, the panel becomes complete. The average overhead projector is not adequate to project the image from an LCD panel. A light source offering at least 3000 lumens is necessary when using an LCD panel. Adequate LCD units provide a minimum resolution of 640 × 480 pixels with 24-bit color. Such an LCD panel (active) costs about \$3000. A projector with an integrated active LCD and light source will average \$7000. The units naturally become more expensive with additional features, such as audio amplifiers and speakers. Rental units are available. It is important to note that these projection units act like printers, requiring a nearby computer to run the presentation program. For those considering a traveling presentation, a laptop computer (like

the one specified above under "The Computer") will be necessary. This adds an additional \$5000 to the cost.

The Internet: A Low-Resolution Caveat

The explosive growth of the Internet has made it a viable means for contacting prospective patients and communicating with colleagues. Those physicians interested in maintaining a presence on the World Wide Web may wish to seriously consider the fact that an inexpensive digital system produces images that tend to be more compact than scanned slides and are, therefore, perfectly amenable to inclusion in a World Wide Web (WWW) site. The average Internet user uses a slow modem connection for access. In this case, higher quality images, which tend to be large, may be counter-productive. Large graphic images may take several minutes to be transmitted to the user's computer through a modem. It is a known fact that Internet users tend to go elsewhere when asked to wait.

The inclusion of low resolution and, therefore, smaller images produced on lower cost (\$500 to \$800) digital cameras can enhance your online presence without delaying transfer time over slower modem connections. In this situation, the cost of a color laser printer is probably not justified as ink jet printing should be adequate for these low resolution images should you need hard copies. The images produced on these low-end cameras will not suffice for your photodocumentation but might enhance your online image inexpensively.

Software

Those with computing experience know that software is one of the most important aspects of computer use. It is also the aspect that is in the most dynamic phase. The use of digital images as archival tools has been discussed, but their use in advertising is just beginning to develop. Companies using digital images with morphing software have started to appear. Morphing involves the modification via computer algorithm of an image. Many patients expect to see digital renditions of their prospective postoperative appearance at consultation. The problem is that many patients consider the images to be an "implied guarantee." Appropriate documentation of the limitations of the images must be done, and it should be made clear that there is no implied guarantee. As many image manipulation programs are available on the consumer market inexpensively, another question presents itself: can postoperative images be changed? The answer, of course, is "yes." For this reason, surgeons should note that, at the present time, digital photography is not acceptable for the American Board of Plastic Surgery examination, but that will probably change in the near future.

Software for database and archival purposes is also in development for organizational functions in the office. As these different programs are perfected, the truly useful purposes of digital imaging will become more available. Verification systems to access original (versus manipulated) images are also becoming available.

The Bottom Line

Digital photographic technology is improving and the cost is falling to the point that digital photography is becoming less expensive than traditional photodocumentation. Those seeking a high-end digital system to replace their current chemical system can anticipate an expense of about \$20,000 for the camera, computer, back-up system, and printer. An inexpensive system is useful for Internet purposes.

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Recommended Reading

Hurwicz, M. Color Lasers Hit the Spot. In *Publish*. San Francisco: International Data Corp, May 1997. P. 74.

Weibel, B. Removable Storage for the Masses. In *Publish*. San Francisco: International Data Corp, June 1997. P. 82.

OPERATING ROOM

Extension 23266 to schedule

Room 10 and 11 Monday and Wednesday. Room 10 Tuesday, Thursday and Friday.
The primary resident responsible for the case must be in Operating Room when the patient arrives.
It is the Junior Resident's responsibility to get films when indicated.

STARTING TIMES:

Monday, Tuesday, Thursday, Friday – 7:30 a.m.

Wednesday – 9:00 a.m.

To post an ER case you must call:

Anesthesiology (Anesthesiologist: 747-5003/Nurse: 747-5002

After Hours Call: Sr. Resident Anesthesia @ Pager 00777

To post an elective case:

Complete information in schedule book in clinic – add name of staff and Senior Resident who reviewed case with you for assistant in OR, cases in Sterile Minor or in Room 16 (DSU) need to be posted in advance by calling Posting (ext. 3266). No add-on cases should begin prior to posted cases, unless specified by the affected Attendings.

Do not post a case without clearing with the Chief Resident and Staff.

A resident On-Service calls X23266 two days in advance when posting cases.

MEDICAL RECORDS ASSIGNMENT

Medical Records will be assigned in the following manner:

1. The Resident that operated on the patient will be responsible for completing the record. This includes signatures and dictation.
2. When there is no surgery, the chart will be assigned to the Resident that followed the patient throughout his/her hospital course.
3. If a Resident assigned to Shriners Burns or Adult Burns performed the surgery, then the team following the patient will be responsible for completing the record. The responsible doctor will be determined by the Resident following the patient's post-operative course.
4. A chart will be assigned to the Intern only if he performed the surgery on a patient. He must be the primary surgeon, not an assistant.
5. **Residents with delinquent operative notes will not be allowed to operate**, and will be relieved of all duties until the operative report is completed and documentation of such is obtained from Medical Records.

DICTATING INSTRUCTIONS

Dictation will not record unless all 15 digits are entered into the touch tone telephone prior to dictating.

Operative Report
EXT. 22660

Discharge Summary
EXT. 26605

Priority Reports
EXT. 26608

TO DICTATE (after beep):

1. RESIDENTS: Enter four (4) digit ID#
 Enter four (4) digit attending ID#
 ATTENDING: Enter four (4) digit ID#
 Enter four (4) digit ID# again
 *If the ID# is less than four (4) digits, place zeros (0) at the
 FRONT to make it six digits.
1. Enter six (6) digit patient UH# (do not enter alpha-character).
 *If UH# is less than six (6) digits, place zeros (0) at the FRONT to make it six
 digits.
3. 1 = operative report
 2 = discharge summary
 3 = clinical summary
 4 = clinical operative report

You will hear a soft ready tone.

Begin dictation. Recorder stops and starts with your voice. (You will be disconnected after 4 minutes if you have not resumed speaking or used button 4 to pause).

TO PAUSE: Push four (4). (You will be disconnected if you are in pause for over 15 minutes).

TO RESTART: Push two (2), then resume dictation after pause, rewind, or listen.

TO REWIND AND PLAYBACK:
 Push three (3), will rewind 10-15 words and begin automatic playback.

TO EDIT: 1. Push eight (8) for rewinding
 2. Push four (4) to stop at place for edit
 3. Push one (1) to listen to dictation
 -or-
 4. Push two (2) to dictate on previous dictation

FAST FORWARD:
 Push seven (7)

DICTATING INSTRUCTIONS

(Continued)

MULTIPLE DICTATIONS: This must be used for more than one dictation.

1. Push five (5) between reports, your four (4) digit attending ID# is automatically reentered
2. Residents: Enter four (4) digit attending ID#
3. Attending: Enter four (4) digit attending ID# again
4. Enter patient UH#
5. Enter one (1) digit report number (see above)
6. Push two (2) to resume dictation

FOR ASSISTANCE/INSTRUCTIONS:

Push 0 (intercom), or call extension 21675 or 21840

TO CLEAR ID#:

If an error is noticed before entering all 15 numbers, push * to clear all numbers. Numbers can only be cleared prior to the last ID digit being entered.

TO CLEAR ID#:

Low/Continuous	=	Dictate
Low/Intermittent	=	One minute left on tape
High/Intermittent	=	Wait to dictate – tape changing
High/Continuous	=	Stop dictation – tape full

****TO ASSURE ACCURATE TRANSCRIPTION OF YOUR REPORT, THE FOLLOWING INFORMATION IS REQUIRED AT THE BEGINNING OF EACH DICTATION:**

1. Identify yourself
2. Identify your department/service
3. Identify the type of report
4. Identify the attending physician
5. Identify the patient – Name and UH#, please spell patient's name
6. Give age, sex, and race of the patient
7. If you are dictating a discharge summary, give admission and discharge dates
8. If you are dictating an operative report, give the date of surgery, name of surgeon, and name of assistant (s)
9. If a copy of the report is to be sent to the referring physician, give the name and address of that physician
10. Identify the date of dictation

FOR ASSISTANCE, PLEASE CALL EXT. 21675 OR 21840

Go to Medical Records at least weekly. When leaving, you must designate an "alternate" who will sign off charts for you.

RESIDENT OPERATIVE RECORDS
Plastic Surgery Operative Log (PSOL)

The Residency Review Committee for Plastic Surgery requires that each resident keep a detailed record of operative experience. The maintenance and accuracy of this record are the responsibility of the individual resident. In addition, copies of operative notes must be kept for all cases in which the resident is listed as responsible surgeon. **You will need this to obtain hospital privileges when you leave the residency.**

The Residency Review Committee uses a computerized program for the compilation of the resident's operative experience. We now have the PDA version, downloading to the Internet. You **MUST** use this system!

The residents will download and print their PSOL quarterly to allow review for deficiencies.

Chief residents will **NOT** be allowed to leave before reviewing and signing off on their final PSOL with Dr. Phillips.

EMERGENCY ROOM

1. The resident On Call that day covers ER from 5:00 p.m. to 7:00 a.m.; from 7:00 a.m. to 5:00 p.m. in the ER is covered by residents assigned to JSH-Staff Team; Shriners resident and research resident are exempt from daytime calls unless coverage is requested by the Chief Resident. Weekend Call is Saturday 8:00 a.m. – Sunday 8:00 a.m., and Sunday 8:00 a.m. – Monday 7:00 a.m.
2. Prompt response to all ER Call is absolutely mandatory at all times.
3. Inform Chief Resident of all admissions at the time of admission and ER consults. Inform Attending Staff of all patients (admissions and/or outpatients) seen in the Emergency Room.
4. Photographs must be taken of all ER consultations and admissions as part of the H&P or consult.
5. Patients are admitted to the staff physician On Call unless they are established patients of a different staff physician.
6. Emergency Room paperwork:
 - On ER face sheet include the following:
 - a. “see Plastic Surgery consult”
 - b. diagnosis
 - c. disposition – clinic appointment date
wound care instructions
medications
 - d. your signature
 - e. give patient an appointment card
 - On Consultation Sheet record the following:
 - a. accurate history and examination
 - b. description of any procedure performed
 - c. diagnosis and treatment plan
 - d. name of staff doctor you discussed the consultation with

Retain the consultation sheet, the yellow copy of the ER form (copy of face sheet), and the white billing sheet. These forms must be turned in to the Plastic Surgery Billing Office by 8:00 a.m. the following morning.

 1. The Minor OR in the ACC is available for outpatient ER cases. Contact the ER Head Nurse for access.
 2. The resident On Call is responsible for all of the following regarding ER admissions: H&P, admit orders, admit note, pertinent lab and X-rays, photos, operative consents (obtain consents before pre-medication), posting of ER cases in OR, discussion of operative plan with patient and Chief Resident and staff. ER patients should only be sent to the clinic of the Attending staff accepting the patient for treatment.

BILLING PROCEDURES

Clinic Billing

Clinic billing sheets must be signed each day. Type of interaction and diagnosis must be filled out.

In-Patient Consultations

All consultations must be seen by a Faculty member, and the Faculty member must write in the chart. Return the completed consultation form to the Billing Office mailbox in the Plastic Surgery Office. Be sure to list the Faculty name on the consultation form.

Prior Authorization for Reduction Mammoplasty

Some insurance companies will cover a reduction mammoplasty if it is medically necessary.

It is necessary to obtain prior authorization.

To obtain prior authorization send the following information to the insurance company:

1. Name of insured and insurance company policy number
2. Complete history and physical including height, weight, and breast size (record in initial clinic note)
3. Functional disability caused by condition
4. Pre-operative photographs (first visit)

All third party payers except Medicare require precertification. Call Ext. 20149 prior to posting the case.

EVALUATION AND FEEDBACK

Four times per year each resident will make a patient presentation that addresses the ACGME competencies. In addition, three times yearly the Faculty will meet for evaluation of the performance of the resident. Evaluation will include assessment of knowledge, clinical ability, problem solving, operating skills, and attitude based on the ACGME competencies.

Following this meeting, Dr. Phillips will meet privately with each resident to discuss the evaluation and progress in training. These conferences are intended to be constructive and helpful, rather than occasions for criticism and “chewing out”. The resident should not approach them with a defensive or negative attitude. At the same time, the resident will have an opportunity for comments and critique of his experience during the rotation, but should not use this as simply an opportunity for griping.

The In-Service Exam is mandatory for all residents. An Oral Exam is held yearly.

Failure to perform well on standardized exams (Surgery Board Exam failure, or <30 percentile on the In-Service Exam), or an inability to demonstrate sufficient progress in the operating room (in terms of PSOL numbers and operative independence) may lead to failure to progress in the residency.

The following pages contain a copy of the areas of evaluation and expectations, and a copy of the evaluation form.

Residents are required to complete faculty evaluations via the electronic MyUTMB system in order to maintain anonymity.

The Division holds a quarterly review. Attendance is mandatory for all residents and faculty.

Assessment of General Competencies in Plastic Surgery

The ACGME has endorsed general competencies for residents in the areas of:

- Patient care
- Medical knowledge
- Practice-based learning and improvement
- Interpersonal and communication skills
- Professionalism
- Systems-based practice

These competencies will be evaluated, in part, via presentation of index cases appropriate for the resident level, four times per year. This project will result in the development of a portfolio for each resident that demonstrates their surgical maturation from the PGY-3 to PGY-5 level.

Competency Presentation:

15 minutes will be allotted for each presentation; therefore, they must be concise and well organized. The resident should be familiar with the full description of the ACGME competencies in order to demonstrate how the case has fulfilled aspects of the 6 categories.

It is suggested that by utilizing the following outline, at least five of the six categories will be addressed:

- Pre-operative evaluation and planning
- Analysis of options
- Planning sheet
- Intra-operative management
- Post-operative care
- Post-discharge care
- Evaluation of outcome; aesthetics, function, impact on patient's quality of life
- Coding

Resource use analysis: charge to patient, post-operative (monetary or otherwise), how was case covered. Examples of cases appropriate for resident level are:

PGY-3

Z-plasty
Skin graft
Excision of skin malignancy
Extensor tendon repair
Metacarpal fracture
Local flap coverage of soft tissue defect
Harvest of Iliac crest bone graft

PGY-4

Breast augmentation
TE/Implant
Reduction mammoplasty
Flexor tendon repair
Pressure ulcer coverage
Abdominoplasty
Mandible fracture
Microtia

PGY-5

Cleft lip repair
Cleft palate repair
Autologous breast reconstruction
Lower extremity coverage
Face lift
Otoplasty
Rhinoplasty
Blepharoplasty
Iliac bone graft

GENERAL COMPETENCY RATING SHEET

Patient Care:

(1) Novice	(2) Advanced Beginner	(3) Competent for Resident Level	(4) Proficient	(5) Expert
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Comments:

Medical Knowledge:

(1) Novice	(2) Advanced Beginner	(3) Competent for Resident Level	(4) Proficient	(5) Expert
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Comments:

Practice-Based Learning and Improvement:

(1) Novice	(2) Advanced Beginner	(3) Competent for Resident Level	(4) Proficient	(5) Expert
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Comments:

Interpersonal and Communication Skills:

(1) Novice	(2) Advanced Beginner	(3) Competent for Resident Level	(4) Proficient	(5) Expert
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Comments:

Professionalism:

(1) Novice	(2) Advanced Beginner	(3) Competent for Resident Level	(4) Proficient	(5) Expert
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Comments:

Systems-Based Practice:

(1) Novice	(2) Advanced Beginner	(3) Competent for Resident Level	(4) Proficient	(5) Expert
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Comments:

QUARTERLY EVALUATION OF PLASTIC SURGERY RESIDENTS

1. **Knowledge:**

General knowledge of medical information (Surgery Board Exam)
Broad knowledge of plastic surgery
Knowledge of literature related to development of plastic surgery
Knowledge of current literature including controversial areas
Timing learning about current clinical procedures
Attitude and initiative toward self-improvement and learning
In-Service Exam scores >30 percentile

2. **Clinical Ability:**

Ability to establish rapport and maintain 2-way communication with patients
Quality of work-ups – thoroughness and pertinence
Quality of records – progress notes, operative notes, summaries, etc.
Ability to perform/use basic clinical techniques
Quality of pre- and post-op management; number of operative cases
Development of clinical judgement
Thoroughness of preparations for surgery, conference, etc.
Attention to detail

3. **Problem Solving:**

Inventiveness and innovation
Analytic (& diagnostic) skills
Application to visualize technical steps and pitfalls in proposed solutions
Consideration and planning of alternatives

4. **Operating Skills**

5. **Attitudes:**

Realistic appraisal and awareness of own strengths and weaknesses
Professionalism as physician, appearance and demeanor
Readiness to accept instruction/correction
Effectiveness of 2-way communication with juniors, seniors, peers, ancillary personnel, leadership
Promptness, attentiveness, perseverance, initiative, ambition

PLASTIC SURGERY IN-SERVICE EXAMINATION

Each year the Plastic Surgery Education Foundation offers an In-Service Examination. The test is usually administered in March, and may be taken by residents, fellows, and practicing surgeons. The participant receives a score in relation to the entire group taking the exam and one relation to his/her peer group. Therefore, it is an excellent means of evaluating your current educational level.

The examination also provides a break-down of scores in specific "content areas". The participant can thus identify his/her own areas of relative strength and weakness, as a guide to future study. The participant also receives a statement of all his/her incorrect answers and a syllabus, which provides a detailed discussion of each question. Most participants find the In-Service exam to be an excellent educational exercise and self-assessment tool.

It is expected that each resident will perform satisfactorily (50th percentile or above) on the In-Service Examination. Failure to do so can result in a resident being placed on probationary status.

M&M

In order to standardize these reports, we will do so in an H&P format:

1. Patient initials
2. Operation and date: PICTURES!
3. Complication and date: PICTURES!
4. Brief summary of H&P; hospital course including operation and complication; describe therapy rendered
5. Follow-up: **PICTURES!**

STUDY MATERIALS

The Division of Plastic Surgery has a large collection of books, sound/slide programs, and reprints available for your use. They are also needed by others. They should be used in the library. In the event that it becomes necessary to remove anything from the library, they must be signed out by leaving a note card with the Plastic Surgery residency coordinator that includes the name of the reference, the borrower and the date borrowed. No materials will be removed from the library for more than 48 hours. It is important to adhere to this policy, as there are occasions when a particular book is needed immediately. Therefore, the whereabouts of the book is imperative. In the event that adherence to this policy becomes a problem (i.e. books are not being checked out or returned in a timely fashion), no materials will be removed from the library under any circumstances.

PLASTIC SURGERY JOURNALS

A number of journals deal entirely or predominantly with Plastic Surgery topics. Some of these offer discounts to residents who wish to purchase subscriptions. The following is a partial list of these journals, with subscription information when available.

PLASTIC SURGERY NEWS

3580 Hythe Court

Columbus, Ohio 43220

(NOTE-PSN is an informative publication of the ASPRS. It contains reports of Society activities and meetings, descriptions of government actions, classified ads, etc. Residents can receive PSN at substantial savings if they become members of the ASPRS Resident Affiliate Group).

****PLASTIC AND RECONSTRUCTIVE SURGERY**

Williams & Wilkins

428 East Preston Street

Baltimore, Maryland 21202

(NOTE-Members of the ASORS Resident Affiliate Group receive a substantial discount)

****ANNALS OF PLASTIC SURGERY**

Little, Brown & Co.

34 Beacon Street

Boston, Massachusetts 02105

BRITISH JOURNAL OF PLASTIC SURGERY

P.O. Box 11318

Birmingham, Alabama 35202

CLINICS IN PLASTIC SURGERY

W.B. Saunders Co.

West Washington Square

Philadelphia, Pennsylvania 19105

BURNS

John E. Wright & Sons, Ltd.

632-825 Bath Road

Briston BS45NU

England

JOURNAL OF BURN CARE & REHABILITATION

P.O. Box 416

Spring Lake, NJ 0776

MICROSURGERY

Alan R. Lisse, Inc.

150 Fifth Avenue

New York, NY 10011

PLASTIC SURGERY JOURNALS

(Continued)

CLEFT PALATE JOURNAL

American Cleft Palate Association
331 Salk Hall
University of Pittsburgh
Pittsburgh, Pennsylvania 15261

JOURNAL OF TRAUMA

Williams & Wilkins
428 East Preston Street
Baltimore, Maryland 21202

AESTHETIC PLASTIC SURGERY

Springer-Verlag New York, Inc.
44 Hatz Way
Secaucus, New Jersey 07094

FACIAL PLASTIC SURGERY

Thieme-Stratton Inc.
381 Park Avenue South
New York, New York 10016

EXCERPTA MEDICA PLASTIC SURGERY

Excerpta Medica, Inc.
P.O. Box 3085
Princeton, New Jersey 08540

AMERICAN BOARD OF PLASTIC SURGERY

Certification of Prerequisite Training

The Plastic Surgery Resident must have completed all prerequisite training prior to the start of Plastic Surgery residency. The American Board of Plastic Surgery will review the resident's prior training, and issue a letter verifying this training at the completion of the review. This letter should be obtained prior to the start of residency, and a copy should be provided to the resident's Program Director.

Requirements for Certification

The American Board of Plastic Surgery Inc. will contact you during your senior year of residency. Follow all deadlines as listed. At this time, an Application for Examination and Certification form will be provided. The Board also issues a "Booklet of Information" which is extremely useful in assembling the appropriate supporting letters and co-documents, and in preparing cases for the Board examination. This booklet is updated frequently, so the resident would be well advised to utilize the most recent edition while assembling materials for Certification.

Applications, booklets and additional information may be obtained by writing:

The American Board of Plastic Surgery, Inc.
Seven Penn Center, Suite 400
1635 Market Street
Philadelphia, Pennsylvania 19103-2204
(215) 587-9322

You must complete the application form and return it to the office of the Board as soon as possible. Applications for admission to the upcoming Qualifying (written) Examination, to be given in the Fall of the following year, **must** be received during the Spring of the Chief Resident year. The application must be completed accurately and signed by you. A standard form will be provided by the Board to Program Directors for completion at the end of the residency. This form shall require two signatures by the Program Director, one affirming that the trainee has completed the program, and a second indicating that the training is recommended for admission to the examinations for certification. If the Program Director elects not to sign either statement, he or she shall state in writing on the form the reasons and basis why he or she makes such decision.

It is your responsibility to obtain letters of recommendation as requested in the application. If you have completed training in more than one program in plastic surgery, the director of each program must verify completion of that program and recommend you for examination. Additionally, the Board may require favorable evaluations and recommendations from other surgeons.

AMERICAN SOCIETY OF PLASTIC SURGEONS (ASPS)

MEMBERSHIP

We encourage all plastic surgery residents to become candidate members of ASPS. Following is the website:

<http://www.plasticsurgery.org>

BLOCK DIAGRAM

PGY-1

General Surgery 3 Months	Trauma 1 Month	Vascular 1 Month	Cardiothoracic 1 Month	Transplant 1 Month	Burns 1 Month	Pediatric Surgery 1 Month	Neurosurgery 1 Month	Urology 1 Month	Plastic Surgery 1 Month
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PGY-2

General Surgery 4 Months	Trauma 1 Month	Vascular 1 Month	Surgical Intensive Care 1 Month	Burns 1 Month	Orthopaedics 1 Month	Anesthesia 1 Month	Otolaryngology 1 Month	Plastic Surgery 1 Month
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PGY-3

Adult Plastic 2 Months	Pediatric Plastic 2 Months	Burns 2 Months	Adult Plastic 2 Months	Pediatric Plastic 2 Months	Burns 2 Months
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PGY-4

Adult Plastic 2 Months	Pediatric Burn Reconstruction (SBI) 2 Months	Miami Aesthetic 2 Weeks	M. D. Anderson (Houston) 1 Month	Adult Plastic 2 Months	Pediatric Burn Reconstruction (SBI) 2 Months	Research 2 Months + 2 Weeks
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PGY-5

Adult Plastic Administrative Chief 4 Months	Pediatric Plastic 4 Months	Texas Dept. of Corrections and Hand 4 Months
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**BLOCK DIAGRAM
6-Year Integrated Program**

PGY-1

General Surgery 3 Months	Trauma 1 Month	Vascular 1 Month	Cardiothoracic 1 Month	Transplant 1 Month	Burns 1 Month	Pediatric Surgery 1 Month	Neurosurgery 1 Month	Urology 1 Month	Plastic Surgery (Adult Service) 1 Month
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PGY-2

General Surgery 4 Months	Trauma 2 Months	Transplant 1 Month	Burns 1 Month	Orthopaedics 1 Month	Anesthesia 1 Month	Otolaryngology 1 Month	Plastic Surgery (Pediatric Service) 1 Month
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PGY-3

Dermatology 1 Month	Oral Surgery 1 Month	Plastic Surgery (Reconstructive Burn Service) 1 Month	SICU 2 Months	Vascular 2 Months	Pediatric Surgery 2 Months	General Surgery 3 Months
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PGY-4

Adult Plastic 2 Months	Pediatric Plastic 2 Months	Burns 2 Months	Adult Plastic 2 Months	Pediatric Plastic 2 Months	Burns 2 Months
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PGY-5

Adult Plastic 2 Months	Pediatric Burn Reconstruction (SBI) 2 Months	Dr. Stuzin (Miami) ½ Month	M. D. Anderson (Houston) 1 Month	Adult Plastic 2 Months	Pediatric Burn Reconstruction (SBI) 2 Months	Research 2 ½ Months
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PGY-6

Adult Plastic Administrative Chief 4 Months	Pediatric Plastic 4 Months	Texas Dept. of Corrections and Hand 4 Months
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**BLOCK SCHEDULE
INDEPENDENT PROGRAM**

First Year

Adult Plastic Surgery	Acute Burn Care	Pediatric Plastic Surgery	Adult Plastic Surgery	Acute Burn Care	Pediatric Plastic Surgery
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Second Year

Burn (Pediatric) Reconstruction	Adult Plastic Surgery	M.D. Anderson*	Miami Aesthetic	Research*	Burn (Pediatric) Reconstruction	Adult Plastic Surgery
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Third Year

Adult Plastic Surgery Administrative Chief Resident	Pediatric Plastic Surgery	Texas Department of Corrections / Hand Surgery*
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*Requested changes in Independent Program

ROTATION GOALS AND OBJECTIVES

Plastic Surgery Integrated Program

General Surgery

Goals of the Rotation

There are two primary focal points of the rotations on the General Surgical Services. The first focal point is experience in preoperative, operative and postoperative management of patients who present to the General Surgical service. The second focal point is the primary component of General Surgery. Specifically, it is the goal that each resident have experience in operative and non-operative lesions of the head and neck, skin soft tissue and breast, alimentary tract and the abdomen, vascular diseases, endocrine diseases, and surgical endoscopy. Beginning with the PGY-1 year extending through the PGY-2 year, it is the goal of this service to offer the resident exposure in the preoperative diagnosis and medical management of patients with this category of disease. Residents will participate in the operative management fitting within these categories, and finally, residents at each level of training will be expected to play a role in the postoperative management and follow-up of these patients. He/she will address educational issues and present at Grand Rounds on areas represented in the primary components of General Surgery. He/she will establish treatment strategies in the preoperative and postoperative management and care of patients in this area, and assist in the operative training and education of subordinate residents and students.

Objectives Learned

The PGY-1 and PGY-2 residents are expected to gain experience and instruction in the foundations for preoperative evaluation and the post operative management of patients who present to the hospital with disorders in the primary components of General Surgery. Although some operative experience is likely in the first two years, the focus of these years is primarily in evaluation and management of patients. Thus, the resident has exposure to the appropriate laboratory and imaging techniques involved in defining diseases within the primary components, for example interpretation of CT scan of the abdomen or mammogram for breast diseases. The skills required to perform history and physical exam will be emphasized. Experiences overlap between hospitalized patients and clinic patients, and much of the diagnostic experience is obtained during clinic evaluation. After operation, the ongoing medical management of patients in the postoperative period, including laboratory and imaging information, is reviewed by the first and second year residents. Pathology reports will be discussed in order to strengthen the ability of interpreting carefully the implications of these findings. These data form the basis for the appropriate follow-up of patients. Finally, PGY-1 and PGY-2 residents gain exposure to the long-term clinic follow-up of patients after operation and after discharge from the hospital including such features as possible side effects of operative intervention and recognizing anticipated outcomes of specific operative procedures. Operative experience is progressive, with less time assisting and more time operating as surgeon in the PGY-2 year.

Surgical Intensive Care Unit

Goals of the Rotation

Rotation through the Surgical Intensive Care Unit (SICU) is intended to introduce PGY-2 residents to the evaluation and care of critically ill surgical patients. Through practical, supervised experience residents are expected to establish a baseline knowledge and competency that will be utilized and further enhanced in the remainder of the residency.

Objectives Learned

After completion of the two-month rotation, residents are expected to have achieved the following educational goals: 1) the ability to perform an initial evaluation and stabilization of new SICU patients including proposing and implementing the means necessary; 2) ability to recognize and initiate appropriate treatment of common acute problems in the SICU including, but not limited to, respiratory distress; shock, whether hypovolemic, septic, neurogenic or cardiogenic; renal failure; arrhythmias; nosocomial infections; 3) ability to assess nutritional need and formulate and institute a rational plan to address them; 4) competence in troubleshooting and interpreting commonly used monitoring equipment; 5) competence in ventilator management including working knowledge of commonly used modes of ventilator support; 6) demonstrated competence in endotracheal intubation, insertion of central lines, insertion of arterial lines and placement of pulmonary artery catheters; and 7) competence in daily management of critically ill patients including assessment, formulation of a management plan and its implementation.

Pediatric Surgery

Goals of the Rotation

The goal of the rotation in Pediatric Surgery is to expose the resident to the preoperative evaluation of pediatric patients with surgical disorders. This will include expertise in evaluation of laboratory and imaging information as well as history and physical examination. Specific attention is given to fluid management and acid base status of very young patients as well as working with adjustments in hydration and in pharmaceutical management of pediatric patients of varying sizes and metabolisms. Acquisition of operative skills in simple and progressively complex pediatric surgical procedures is also a goal, and finally the postoperative management and long-term follow-up of patients with specific pediatric surgical diseases is achieved.

Objectives Learned

The PGY-1 resident receives guidance and instruction regarding evaluation of common disorders such as appendicitis and somewhat more complex disorders such as necrotizing enterocolitis or congenital anomalies. The PGY-3/4 resident participates in the supervision of the PGY-1 resident and interfaces directly with the assigned faculty in Pediatric Surgery. The resident is offered an opportunity to learn skills in the operative management of simple pediatric surgical diseases and refines his/her skills in the post operative management of patients with these diseases. A complete understanding of the diagnostic and therapeutic strategy for each of these patients is achieved by exposure to the spectrum of pediatric surgical diseases seen during his/her rotation. By virtue of our own pediatric hospital within our complex, it is possible to anticipate that the rotation in Pediatric Surgery will expose the resident to the entire spectrum of pediatric surgical diseases. An important unique feature of this rotation includes development of skills for interdisciplinary management of patients by sharing the clinical decisions with representatives from General Pediatrics and specialty divisions of Pediatrics,

including Pediatric Intensive Care and Neonatology. A broad program using extracorporeal membrane oxygenation offers the resident significant experience in critical care management of neonatal patients. Cognitive information is obtained by means of weekly pediatric surgical conferences as well as periodic conferences in the Department of Pediatrics which require significant contributions by the representatives from Pediatric Surgery. The resident supervises and participates actively in the outpatient clinics for Pediatric Surgery.

Trauma Service

Goals of the Rotation

The Trauma Service is the primary setting for surgical trainees to learn the continuum of principles involved in the care of injured patients, and in addition, provides significant exposure to the assessment and care of patients with non-traumatic emergent surgical conditions. The resident assignments are designed to provide a graduated increase in responsibility for each level trainee, PGY-1, PGY-2, and PGY-4.

Objectives Learned

The PGY-1 rotation is one month in duration and is designed to teach the principles of routine patient care including the identification of those at risk for iatrogenic complications and meticulous attention to detail in their avoidance. The PGY-1 rotation provides the trainee with the opportunity to learn the indications for and technical aspects of basic procedures including: thorough physical examination, phlebotomy, intravenous access, insertion of nasogastric and urinary catheters, splinting of injured extremities, suturing of lacerations, and thoracostomy tube insertion. PGY-1 trainees routinely perform appendectomy and herniorrhaphy while on the Trauma/Emergency Surgery rotation under the supervision of the senior resident and the attending physician.

The PGY-2 rotation is designed to provide an increased level of responsibility for initial assessment of acutely injured and ill patients. The PGY-2 is responsible for performing the initial assessment of trauma patients and is also responsible for the non-trauma surgery emergency consultations. Through the intense exposure to a large number of patients with a diverse spectrum of illness, the PGY-2 develops increased clinical diagnostic skills and is able to develop plans of action, including the decision on the need for operative intervention in conjunction with the senior resident and the surgical faculty. The PGY-2 rotation provides for significant ICU exposure and responsibility in the management of critically injured patients, with a daily ICU load of 2-8 patients/day. The PGY-2 rotation provides the trainee with the opportunity to learn the indications for and technical aspects of more advanced techniques and procedures including: the use of mechanical ventilators, the insertion and use of pulmonary artery catheters, diagnostic peritoneal lavage, interpretation of abdominal CT scans and abdominal ultrasound. PGY-2 trainees routinely perform emergency operations under the supervision of the senior resident and the attending faculty.

Transplant Service

Goals of the Rotation

Goals of the Transplant Service rotation are to develop a working knowledge of transplantation including the actual transplant procedures (living and cadaveric donor and transplant recipient procedures), the immunosuppression used to maintain the organs, and the complications, both procedural and medication induced, that may occur and how to deal with these problems.

The following intellectual objectives are taught during resident rotation on this service: what organs can be transplanted, rationale for donor choice, rationale/workup for recipient eligibility, immunosuppression (what drugs are used, how do they work, side effects), immunobiology of rejection and tolerance, complications post-transplant, primary caretaker concerns for transplanted patients (all - fever and neurologic complaints, kidney - abdominal/graft pain and elevated creatinine, pancreas - elevated glucoses). Residents are evaluated on their examination skills (renal, pancreas, liver, heart), radiologic interpretational skills (VCUG, renal scan, ultrasound of the transplanted kidney and pancreas, donor arteriograms), and procedural skills (central lines, paracentesis, first assisting with access surgeries, first assisting with transplant surgeries, creating vascular anastomosis). The following exceptional objectives are also evaluated: ongoing research, small bowel, new immunosuppressants and islet cells.

Vascular Surgery

Goals of the Rotation

The goals of the rotation on the Vascular Surgery service are to accurately evaluate, correctly diagnose and adequately treat patients with vascular disease. It is imperative for the resident to understand the risk factors for atherogenesis, the associated diseases which occur in vascular patients, the natural history of vascular disorders, with and without treatment, and the treatment alternatives available.

Objectives Learned

There are three residents on the Vascular Surgery service at any given time: one chief resident (PGY-5), one junior resident (PGY-2) and one intern (PGY-1). The goals for the PGY-2 resident during the rotation are to accurately evaluate, diagnose and treat vascular patients with vascular diseases. These goals are attained by performing vascular consultations on patients in the Emergency room and in-patient setting. The junior resident also evaluates out-patients in the clinic setting and performs some vascular surgical procedures including placement, thrombectomy and revision of dialysis access grafts, construction of AV fistulas for dialysis, saphenous vein harvesting, and portions of other major arterial reconstructive operations. The goals for the PGY-1 include performing an adequate history and physical examination of the patient with vascular disease, helping to manage the in-patient with vascular disease, evaluating clinic patients with vascular diseases, and performing debridements and amputations in the vascular surgery patient. These functions at each resident level are always performed under direct supervision by faculty members with training in vascular surgery.

Cardiothoracic Surgery

Goals of the Rotation

The Cardiothoracic Surgery rotation provides a primary setting for the Surgery resident to learn the principals and practice of preoperative, intraoperative and postoperative care of general thoracic surgical problems. The General Surgery resident in direct collaboration with the Cardiothoracic surgery resident is expected to evaluate a patient for a general thoracic problem by history, physical exam, laboratory data and non-invasive tests to determine the appropriateness of operative intervention or invasive radiology care. The resident should be able to describe the appropriate invasive approach and the information required. These goals are achieved by daily discussion and review with the attending physician . The Surgery resident is also responsible for all General Thoracic Surgery consults and for participating in our weekly multiple disciplinary lung cancer and thoracic surgery clinic in collaboration with Pulmonary Medicine, Pathology, Radiation Therapy and Interventional Radiology.

Objectives Learned

The educational objective of the Surgery resident is to evaluate the problems concerning chest wall, lungs and pleura, trachea and bronchia, mediastinum and pericardium, diaphragm and esophagus, as well as understanding the basics of acquired heart disease thoracic trauma. The residents are exposed to congenital heart disease and cardiac transplantation as well as the mechanisms of cardiopulmonary bypass. The minor procedures which a General Surgery resident is expected to master include bronchoscopy, mediastinoscopy and tube thoracostomy.

Burn Service

Goals of the Rotation

Goals include learning assessment and classification of burn wounds, including estimation of burn size, depth and reduction of related morbidity and mortality; gaining an appreciation of stress response to acute burn injury, including hemodynamic, metabolic, nutritional and immunologic sequelae; learning initial management of the acute burn patient, including fluid resuscitation, nutritional support, wound care and ventilatory management; learning wound management of burn patients, including an understanding of wound healing, wound sepsis, topical antimicrobial agents, biological dressings and skin substitutes, and skin grafts; developing fundamental surgical skills in treatment of burn patients, including wound debridement, wound dressing and splinting , skin grafting, and scar contracture release; gaining an appreciation for burn rehabilitation, including physical/occupational therapy, psychosocial support and reconstructive needs; improving communication and leadership through interactions and coordinated discussions with patients and their families, attending physicians, medical personnel, medical students and fellow residents; learning principles of management of injuries of a special nature, including inhalation injuries, chemical injuries, electrical injuries and dermatologic conditions necessitating the wound and surgical care that only a burn center can provide.

PGY-3 Plastic Surgery

Goals of the Rotation

The resident will return to the Burn service for progressive experience with the evaluation and treatment of acute burns. The resident is expected to supervise the PGY-1 and PGY-2 residents and serve as back up for them. The resident will help educate the students and the more junior residents in the evaluation and treatment of the acute burn including fluid management. The resident will become more experienced with the operative debridement and resurfacing for acute burns. The resident will become more adept in recognition and treatment of burn complications, particularly infections. The resident will be adept at running a fluid resuscitation and evaluating the patient for smoke inhalation, compartment syndrome, and related trauma.

Objectives Learned

Successful management of the acute burn patient requires prompt aggressive fluid resuscitation, metabolic/nutritional support, control of bacterial infection, anticipation and prevention of complications, timely closure of the burn wound and early initiation of rehabilitation therapy. Burn shock must be adequately treated. Post-burn malnutrition must be prevented. In the post-burn stress response, all major organ systems are affected. Closure of the wound is essential for correction of the pathophysiologic post-burn derangements. In essence, management of the burn patient is a race against time, as rapidity of wound closure is inversely related to complications and mortality. This race must be tempered with thoughtful considerations of ultimate function, cosmesis and quality of life.

Urology

Goals of the Rotation

The goal of this rotation is to provide the PGY-1 resident with the ability to evaluate and be familiar with the treatment of urologic problems.

Objectives Learned

The resident will attend the outpatient clinic and the emergency room and become familiar with the evaluation and management of common urologic problems such as benign prostatic hypertrophy, renal or uro-lithiasis, urologic trauma, and benign and malignant neoplasms. The resident will learn the inpatient care of operative and non-operative patients by participation in the service. The resident will attend the operating room and be familiar with the anatomy and physiology pertinent to urologic patients.

Neurosurgery

Goals of the Rotation

The goal of this rotation is to provide the PGY-1 resident with the ability to evaluate and be familiar with the treatment of neurosurgery problems.

Objectives Learned

The resident will attend the outpatient clinic and the emergency room and become familiar with the evaluation and management of common neurosurgery problems. The resident will learn the inpatient care of operative and non-operative patients by participation in the service. The resident will attend the operating room and be familiar with the anatomy and physiology pertinent to neurosurgery patients. The resident will learn the emergency room evaluation and management of cranial and spinal head trauma. The resident will learn outpatient evaluation of acquired neurosurgical problems such as vascular malformations and other neoplasms, and participate in the operative and post-operative care of these patients.

Anesthesiology

Goals of the Rotation

The resident will become familiar with the induction and monitoring of patients who have general or regional anesthetics.

Objectives Learned

The resident will participate in the preoperative evaluation, intraoperative management, and post operative evaluation of patients who are undergoing general or regional anesthetics. The resident will learn to evaluate the patient for their anesthetic risk and properly monitor these patients. The resident will become familiar with the pharmacology of a variety of anesthetic agents. The resident will learn common anesthetic procedures both for monitoring and induction of anesthetic, including intubation.

Otolaryngology

Goals of the Rotation

The goals of the rotation in Otolaryngology are to provide the resident with experience in the care of patients with head and neck oncology and pediatric otolaryngologic problems.

Objectives Learned

The resident will spend two separate rotations on this service. The first will provide experience in head and neck oncology. The resident will learn to evaluate and stage head and neck tumors, will participate in the outpatient evaluation and care as well as the inpatient management, including the surgical procedures. The second component of the rotation will provide the resident with experience in pediatric otolaryngology. Particular emphasis will be placed on pediatric airway management and otologic problems such as are part of the care of cleft palate children.

Orthopaedic Surgery

Goals of the Rotation

The goals of the PGY-2 rotation on Orthopaedic Surgery is to familiarize the resident with the evaluation and treatment of adult musculoskeletal trauma.

Objectives Learned

The resident will participate in emergency room evaluation and treatment of musculoskeletal adult fractures and dislocations by taking call with the residents in Orthopaedics. The resident will assist in the inpatient management and outpatient clinic setting of evaluation and management of adult Orthopaedic problems. The resident will participate in the combined cases with Plastic Surgery to evaluate and treat patients requiring soft tissue coverage after such trauma. The resident will participate in the surgical care of these patients. The resident will become familiar with possible orthopaedic complications such as neurovascular compromise and compartment syndrome.

PGY-1 Plastic Surgery

Goals of the Rotation

The major goal and objective of a one-month rotation on Plastic Surgery during the PGY-1 is to provide experience with the subset of patients that are treated by the specialty of Plastic and Reconstructive Surgery. During that time, the PGY-1 will be able to obtain far more than the five cases in the area of plastic surgery that the Surgery Residency Review Committee requires.

Objectives Learned and Method of Teaching (PGY-1)

During the one-month rotation the duties of the PGY-1 would include: 1) primary responsibility for a set of in-patients on the Plastic Surgery service with duty shared by the other Plastic Surgery residents. This means that there will be histories and physicals, patient orders, management and diagnostic plans, participation as the assistant surgeon or the surgeon on that particular surgical case for each patient, monitoring of the patient by being familiar with pertinent laboratory studies and vital signs, and other duties as assigned by the chief resident on that service; 2) primary assessment and evaluation of the outpatient which is done in the clinic or the Emergency Room. This will be monitored by a resident and then faculty evaluation of the same patient with discussion of the management plan and diagnosis; 3) call rotation will be taken at the same frequency as the junior Plastic Surgery residents and in accompaniment with the junior Plastic Surgery resident. This will mean responsibilities for the in-house patients, return of patient calls and Emergency Room duty with care rendered either in the Emergency Room or the operating room during the call; 4) the PGY-1 will round with the surgical team members, attend clinic, the operating room and all conferences with the service; 5) the PGY-1 will be the surgeon of record for the following types of cases: placement of tissue expanders, removal of tissue expanders with advancement or rotation of the subsequent flap; harvesting and placement of composite grafts, full-thickness grafts, or split-thickness skin grafts; placement of allograft material; debridement and closure of pressure sores; scar revision by direct excision, or local flap rotation; repair of lacerations of the face, hand, and other body parts; 6) during this rotation the resident will obtain additional exposure, but not as surgeon, to the following types of cases: cleft lip, palate, or nasal deformity repair; transfer of skin, musculocutaneous, or free flaps.

PGY-2 Plastic Surgery

Goals of the Rotation

This rotation will provide the resident with progressive experience in plastic surgery. Emphasis is placed on the pediatric rotation.

Objectives Learned

The resident will take call in rotation with the second year residents. This will allow progressive experience with patient evaluation and management both in the emergency room and in the hospital setting. The resident will be assigned to the Pediatric Plastic service at UTMB (Galveston). There the resident will learn the evaluation and treatment of congenital and traumatic pediatric plastic surgical problems. The resident will participate in the Cleft Palate clinic every Wednesday and in the operative experience. The resident will learn the evaluation and management of the cleft lip and palate and the use of the entire Cleft Palate Team. The resident will participate in the evaluation operative and post operative treatment of the children with craniofacial anomalies, myelomeningocele and traumatic injuries.

Adult Plastic Surgery

Goals of the Rotation

The resident will develop progressive understanding and independence in the evaluation and management of adult plastic surgery residents. The PGY-3 resident will become independent in the Emergency Room evaluation of Plastic Surgical patients, with back up from the faculty. The resident will participate in the outpatient evaluation and treatment of Adult Plastic surgical problems, including reconstructive surgery of the breast, trunk, upper and lower extremities, and head and neck.

Objectives Learned

The resident will perform procedures more complex than at the PGY-1 or 2 levels. The resident will instruct the medical students. The PGY-4 rotation will provide the resident with more autonomy in the operating room. The resident is expected to be able to develop an operative or non-operative treatment plan and be able to execute the more simple procedures. The resident may be called upon to assist a PGY-3 resident in a surgical procedure. The resident will have greater responsibility for surgical procedures of the breast and trunk. The PGY-5 rotation provides the plastic surgery resident with senior responsibility. The resident will serve as second call (back up) for the junior residents. The resident is more autonomous in the operating room and is expected to be able to develop a treatment plan for even the most complex and unusual plastic surgical adult problems. The resident will serve as the Chief Administrative Resident and as such is responsible for insuring the smooth running of the patient service as well as administrative responsibilities for conferences and call.

Research Rotation

Goals of the Rotation

The two month of research in the 4th year will provide the resident with the opportunity for a clinical or basic science project. The project must be cleared with the faculty advisor and Dr. Phillips prior to beginning this rotation.

Objectives Learned

The resident may pursue an area of inquiry within or without the Division of Plastic Surgery, but located geographically at UTMB (Galveston). The resident will learn to be critical of research techniques and be able to criticize other research.

Pediatric Plastic

Goals of the Rotation

The PGY-3 rotation will provide the resident with greater autonomy with pediatric plastic surgery patients.

Objectives Learned

More simple procedures will allow them to become surgeon. The resident will become proficient in the outpatient evaluation and treatment of pediatric surgical problems, including congenital and traumatic injury. The resident will be expected to instruct the medical students and assist the faculty or chief resident on the service.

The PGY-5 rotation allows the resident senior responsibility. The resident will organize the service obligations and the residents on that service. The resident is expected to develop a treatment plan for the patient in conjunction with the faculty and be able to execute this plan, whether surgical or non-surgical. The resident is expected to be able to correct cleft lips, cleft palates and participate in the correction of myelomeningocele and craniofacial deformities.

M.D. Anderson

Goals of the Rotation

This month long rotation provides the resident with concentrated exposure to complex microsurgical reconstruction for oncologic problems.

Objectives Learned

The PGY-4 resident is expected to participate in the care of these patients and serve as surgeon or assistant surgeon in these free tissue transfers. The resident has particular exposure to head and neck reconstruction. The resident will become more adept at microvascular surgical planning and techniques, post operative monitoring, and treatment of complications.

Miami Aesthetic

Goals of the Rotation

The PGY-4 resident travel off site to the private practice of Dr. Stuzin.

Objectives Learned

There the resident will become facile with the preoperative evaluation and post operative care of aesthetic patients, particularly those desiring facial resurfacing or other rejuvenation techniques, rhinoplasty, and body sculpturing. The resident will assist as required on this rotation. The resident has exposure to the extensive library of this faculty. In addition the resident will learn the office management of a private practice.

Shriners Hospital

Goals of the Rotation

The PGY-4 resident will spend four months learning principles and techniques of reconstructive surgery for burns.

Objectives Learned

The resident will learn to evaluate the defect, the available donor sites, and construct a surgical treatment plan. The resident will participate in the out patient evaluation and treatment as well as the in patient management and surgical procedures. The resident will serve as surgeon for most procedures, assistant surgeons on those that are more complex. The resident will also participate in the care of the patients with congenital vascular lesions and other pediatric plastic problems as accepted into the Shriners Hospital system. The resident will learn to apply techniques such as skin graft or flap releases, ear reconstruction, tissue expansion for burn alopecia, laser treatment for vascular lesions and use of osseointegrated implants The resident will help to instruct medical students on this service, coordinate this service, and serve as the administrator for the clinical care of these patients.

Texas Department of Corrections of Criminal Justice (TDCJ)

Goals of the Rotation

The PGY-5 resident will serve in a semi-autonomous position to evaluate and treat the patients in the Texas Department of Criminal Justice setting on campus at UTMB (Galveston).

Objectives Learned

The resident will evaluate and manage the patients in both the in-patient and out-patient setting, the resident is expected to be able to develop a surgical or non surgical treatment plan and be able to execute this independently. This rotation allows the resident to work with a PA student for which the resident is responsible to educate and coordinate the activities of the service. In addition, the resident will serve to instruct medical students as appointed to the service.

Hand Service

Goals of the Rotation

This rotation will allow the PGY-5, working with the new plastic surgery hand faculty, to evaluate, and treat more complex hand problems.

Objectives Learned

The resident will learn to evaluate acute and non-acute hand problems, traumatic and otherwise acquired, as well as congenital. The resident will treat long-term complications of flexor and extensor tendon injuries, Dupuytren's contractures, arthritides, nerve compression syndromes, bifid or syndactylized digits, and other congenital diseases. Working with faculty, the resident will develop operative and non-operative management plans and be able to execute these.

**PGY-1 and -2 CORE
CONFERENCE SCHEDULE**

Conference Type (Basic Science, Journal Club, Pathology, etc)	R or O Required or Optional	Frequency	Individual(s) or Department Responsible for Conducting Conference
Grand Rounds	R	Monthly	Rotates among surgical division
Case Conference	R	Weekly	Resident & Faculty
Basic Science	R	Weekly	Resident & Faculty
<i>In addition, on specific rotations:</i>			
Anesthesiology Didactic, lectures	R	Daily	Faculty assigned
Pediatric Surgery Case Conference	R	2 times per month	Resident with faculty
Pediatric Surgery Pathology	R	Monthly	Dr. Hal Hawkins
Pediatric Surgery Journal Club	R	Monthly	Resident
Vascular Interventional Radiology	R	Weekly	Faculty

CONFERENCE SCHEDULE

Conference Type (Basic Science, Journal Club, Pathology, etc)	R or O Required or Optional	Frequency	Individual(s) or Department Responsible for Conducting Conference
Pediatric Cardiac Cath.	R	Weekly	Faculty
Pulmonary Med./Surg. Case	R	Weekly	Faculty
Didactic Thoracic Surgery	R	Monthly	Faculty
Neurosurgery Case Teaching Conf.	R	Weekly	Faculty
Neuropathology (Case-based)	R	Weekly	Faculty
Neurosurgery/Neurology (Case- based)	R	Weekly	Faculty & Residents
Urology Basic Science & Clinical	R	Weekly	Resident
Radiology-GU Case Conf.	R	Weekly	Faculty & Residents
Urology M & M	R	Weekly	Residents
Urology Journal Club	R	Monthly	Residents
Urology Pathology	R	Monthly	Faculty
Urologic Pediatrics	R	Monthly	Faculty

CONFERENCE SCHEDULE
During Rotation of Plastic Surgery Services

Conference Type (Basic Science, Journal Club, Pathology, etc)	R or O Required or Optional	Frequency	Individual(s) or Department Responsible for Conducting Conference
Journal Club 1 Annals 1 PRS	R	2x/month	All Faculty
Surgery Grand Rounds	R	1x/month	Rotates among Surgery divisions
Hand Conference	R	2x/month	Gould
Combined ENT/Plastic Maxillofacial Conference	R	1x/month	Alternates between the two specialties
Indications Conference	R	Monthly	Phillips
Workshops	R	1-2x/month	Varied
Video Conference	R	1x/month	Faculty suggestions
Research Conference	R	Semi- Annually	Wound Healing Fellow
Anatomy Wet-Labs	R	Variable	Scheduled with Faculty
Competencies Presentations	R	Quarterly	All Faculty and Residents

**PROFESSIONAL MEETINGS APPROPRIATE
FOR RESIDENT PARTICIPATION**

PGY-4's & 5's	PGY-3's	PGY-1's & 2's
Breast & Body Contouring	Fresh Start	Fresh Start (PGY-2's)
TSPS	Aesthetic Facial Recon	ACS, Regional
ASSH	ASRM	PSRC
AAPS	AAPS	ABA
AAHS, ASRM	PSRC	WHS
Atlanta Breast Symposium	ASPS	AAPS
Baker-Gordon (5's)	WHS	TSPS
Dallas Rhinoplasty (5's)	Multidisciplinary Symposium on Breast Disease	ACS, National
ASAP (5's)	ACS	ASPS
Aesthetic Fxn through Recon	WHS	Multidisciplinary Symposium on Breast Disease

Guidelines for Supervision of Residents

Faculty are present in-house at all times for surgical cases. On call faculty are immediately available by beeper or phone 24-hours daily. All faculty are present at all times during out-patient office periods assigned to them.

During scheduled operating room time, a faculty member is in the operating room suite. Most days two operating rooms are assigned to the service so that the attending can move between rooms, depending on the complexity of the case. In the Shriners Burns Institute, a faculty member must be in attendance for all cases. Unscheduled emergency surgery is left to the judgement of the faculty member on call. The senior level plastic surgery resident is allowed by the hospital to operate independently. All cases seen for emergency surgery are discussed with the faculty member and a decision is made as to the level of supervision.

Resident Work Hours and Call

The call schedule for PGY-1's and PGY-2's is made by the service on each rotation. On Plastic Surgery, the PGY-1 will rotate with a PGY-3, and the PGY-2 will rotate with a PGY-4. The third and fourth year residents alternate first call so as to assure time off and a full 24-hour period off each week. They are backed by a fifth year resident who can also assure adequate rest for the junior residents. Finally, a faculty member is always on call to back up the residents.

RESIDENT DUTY HOURS AND THE WORKING ENVIRONMENT

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

SUPERVISION OF RESIDENTS

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

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

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

Duty hours are defined as all clinical and academic activities related to the residency program, i.e., patient care (both inpatient 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.

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

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

A 10-hour time period for rest and personal activities must be provided between all daily duty periods, and after in-house call.

ON-CALL ACTIVITIES

The objective of on-call activities is to provide residents 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 residents are required to be immediately available in the assigned institution. In-house call must occur no more frequently than every third night, averaged over a four-week period.

Continuous on-site duty, including in-house call, must not exceed 24 consecutive hours. Residents may remain on duty for up to 6 additional hours to participate in didactic activities, maintain continuity of medical and surgical care, transfer care of patients, or conduct outpatient continuity clinics.

No new patients may be accepted after 24 hours of continuous duty, except in outpatient continuity clinics. A new patient is defined as any patient for whom the resident has not previously provided care.

At-home call (pager call) is defined as call taken from outside the assigned institution.

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. Residents taking at-home call must be provided with 1 day in 7 completely free from all educational and clinical responsibilities, averaged over a four-week period.

When residents are called into the hospital from home, the hours residents spend in-house are counted toward the 80-hour limit.

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.

OVERSIGHT

Each program must have written policies and procedures consistent with the Institutional and Program Requirements for resident duty hours and the working environment. These policies must be distributed to the residents and faculty. Monitoring of duty hours is required with frequency sufficient to ensure an appropriate balance between education and service.

Back-up support systems must be provided when patient care responsibilities are unusually difficult or prolonged, or if unexpected circumstances create resident fatigue sufficient to jeopardize patient care.

DUTY HOURS EXCEPTION

An RRC may grant exceptions for up to 10% of the 80-hour limit, to individual programs based on a sound educational rationale. However, prior permission of the institution's GMEC is required.

SLEEP DEPRIVATION DURING RESIDENCY

Most on-call residents receive little enough sleep to classify as sleep-deprived. Chronic sleep deprivation and impairment in functioning subsequent to loss of REM sleep, as demonstrated by impaired memory consolidation, reaction time, and the ability to process novel and divergent information have been shown in numerous studies on medical residents. Sleep deprived residents are generally grossly inaccurate judges of their impairment level. Many studies have also indicated significant dysphoria connected with sleep deprivation, as well as high increase in number of MVAs post-call.

Some common sleep symptoms related to sleep deprivation in residents:

- Common: Fatigue, irritability, GI upset
- Occasional: Difficulty initiating or maintaining sleep. Involuntary early morning awakenings and inability to return to sleep (often associated with depression). Hallucinations associated with falling asleep or waking up.
- Rare: Sleep walking or REM behavior disorder. Latter involves acting out a dream. Former arises out of slow-wave sleep.

Addendum to Sleep Suggestions:

- If possible, have spouse or significant other manage daytime chores on post-call days. Use dark shades/curtains in bedroom, decrease amount of light exposure going home post-call (sunglasses) to protect your circadian pattern.
- Avoid hot showers/baths prior to bed (body wants a lower temperature at bedtime).
- Post-call: Disconnect your phone or set the machine to automatic answering! If you are post-call, friends and family should be informed this is a needed rest time.
- Avoid sleep agents, such as *Ambien* to decrease sleep latency, as they may interfere with sleep architecture and may lead to habituation, ultimately increasing sleep latency.
- Once you have set your alarm clock, turn it away from your bed. Do not "clock watch".
- There is variability in how much sleep each of us needs. Sleep time affects GH, cortisol, a multitude of cytokines as well as wound healing and BP. Try not to compare your sleep time with colleagues (who are not always accurate in their reports).
- Pagers set to vibrate may be less intrusive than when set to beep. Beeping may sensitize you to environmental sounds while you are sleeping, unnecessarily alerting you.

Alcohol: Decreases sleep latency BUT increases sleep fragmentation.

Caffeine: Increases sleep fragmentation and sleep latency, esophageal reflux. May lead to periodic leg movements. Short-term benefit: increases alertness with 24-hours sleep deprivation, however, efficacy of caffeine rapidly declines during the second night of deprivation. Micro-sleep is then likely, maybe when you are doing surgery.

Fabulous Sleep Sites:

<http://www.sleepnet.com>

<http://www.sleepfoundation.org>

<http://www.sleepinglikeababy.net>

<http://www.users.cloud9.net>

Resident Advancement Policy

After each rotation, a resident evaluation via MyUTMB is completed by the faculty. Three times yearly, the faculty meet to evaluate each resident. The program director then discusses this privately with each resident.

Specific objectives to achieve yearly advancement include:

- The resident's ability to demonstrate at the end of the educational period that he/she is an accomplished surgeon. Resident must be able to develop and execute surgical plans and non-surgical management.
- The resident's ability to demonstrate that he/she has the proper educational information by performance on In-Service Examination to at least the 50th percentile.
- Education of those junior to them must be demonstrated.
- The resident's ability to demonstrate the basic skills in a research laboratory and have the ability to formulate a research plan.
- Finishing year residents must administer their services competently and safely.
- Have been evaluated by the faculty and staff and have satisfied that they are ethical and moral physicians.
- Ability to present and discuss fully didactic topics as assigned.
- Completion of all paperwork (op reports, clinic notes, PSOL's) in a timely fashion.
- The resident's ability to complete the emergency evaluation & management and out-patient care, as well as increasing operative responsibility for each rotation as assigned, according to their level of responsibility by post-graduate year.

PROCEDURE FOR DICTATION TRANSCRIPTION OF CLINIC NOTES

1. At the end of each clinic visit each patient's chart will be sorted by the residents and dictated. Each doctor will have their own dictating number to be used in the phone.
2. The telephone number for dictating is 22611; instructions will follow on how to proceed with each of the dictations.
3. Speak slowly and deliberately into the phone, spell unusual terms, procedures and drugs, etc.