**SERVICE: Burn, PGY 2 – JHH Bayview**

### General description:

The Sinai surgical residents will rotate at the State of Maryland Burn Center at Johns Hopkins Bayview Hospital during their 2nd clinical year. The duration of this rotation is 6 weeks.

The Sinai resident will be a fully integrated member of the Burn Surgery team, under the supervision of the Burn Surgery attending staff and experienced Burn Surgery mid-level provider(s).

The surgical residents will participate in all care rendered to inpatient Burn Surgery patients at the Johns Hopkins Bayview Hospital: admission, diagnostic workup, operations, post-operative care and discharge. In addition, the Sinai surgical residents will participate in the care/operations of Burn Surgery patients in the Burn clinic and Burn Surgery attending office hours.

The surgical residents will attend the following **educational activities**:

- Attending and Fellow Teaching Rounds – three times per week, 1 hour
- Burn Center Conference – weekly, 1 hour
- Surgery Grand Rounds, JHH – weekly, 1 hour
- Surgery Lecture Series, JHH, weekly, 1 hour
- Operative Skills Lab, JHH – monthly, 3 hours

In addition, the residents (all levels) will receive the following **lectures** during the rotation:

- Burn assessment – burn grades/extent and local/systemic pathophysiology; fluid resuscitation in burn patients; antibiotic use in burn patients; inhalation injury; sepsis and burn; management of ventilator dependent burn patients

### Competencies:

#### Goals and Objectives:

**Patient Care:**

**Goals:**

During this rotation, the resident should learn and practice to:

- Demonstrate caring and **respectful behaviors** when interacting with patients and their families; demonstrate **sensitivity** to gender, age, ethnicity, religion, value systems and other potential differences of patients and their families; practice according to the clinical standards of the Johns Hopkins Hospital
- Gather patient and case specific essential, **comprehensive multi-source and accurate information** about their patients for initial or peri-operative work-up and patient follow-up in the inpatient and outpatient setting
- Using all available resources, under the guidance of the senior Burn Surgery resident
and attending, make **informed decisions about diagnostic and therapeutic interventions** based on patient information, up-to-date scientific evidence and clinical judgment; evaluate and implement priorities in patient care and incorporate preventive measures

- Under the guidance of the senior Burn Surgery resident, attending and other designated Burn Surgery related expert personnel, develop and **carry out patient management plans**

- Under the guidance of the senior Burn Surgery resident, attending and other designated Burn Surgery related expert personnel, **monitor** closely the patient’s clinical progress, review and react to variances in patient progress or response to therapeutic interventions; **communicate** the details and changes of patient care, progress and complications to the senior Burn Surgery resident and/or attending in a timely manner

- Under **close and direct supervision** of the senior Burn Surgery resident and attending and other designated Burn Surgery related expert personnel, **counsel and educate patients** and their families on the state of the patient’s disease, necessary diagnostic tests, operative procedures and medical management

- Use information technology (hospital computer system) to support patient care decisions and patient education (electronic patient record, electronic radiology studies, online educational resources, including literature research)

- **Work closely with other healthcare professionals**, including those from other disciplines (Nephrology, Endocrinology, Medicine, mid-level providers, nurses, Burn Surgery office staff, etc.), to provide patient-focused and optimum outcome driven care

- Ensure that the **needs of the patient and team supersede individual preferences** when managing patient care; incorporate evidence-based medicine into patient care whenever possible; comply with changes in clinical practice and standards given by senior Burn Surgery resident and/or attending

**Objectives:**

During the rotation, the resident should:

- Under one-on-one supervision of the Burn Surgery attending, **perform competently and/or assist in procedures** (both in the inpatient and outpatient setting) considered essential for the area of practice, including:
  
a. wound debridement, escharotomy, fasciotomy
  
b. skin grafting (split or full thickness, auto-, allo-, xeno-graft)
  
c. tissue expanders
  
d. scar revision, cosmetic/functional reconstruction
  
e. dressing changes
- Under supervision by the senior Burn Surgery resident, experienced Burn Surgery mid-level provider(s) and attending staff, participate in the **pre- and post-operative surgical management** of patients before and after burn-related procedures (including ICU management); evaluate new emergency and transfer burn patient consultations; participate in daily morning and afternoon patient rounds on the Burn Surgery service at Johns Hopkins Bayview Hospital

| a. Determine the level of care and need for transfer to a burn facility |
| b. Estimate the depth and percent body surface area of burns for children and adults |
| c. Implement fluid resuscitation protocols for children and adults |
| d. Manage systemic effects in the critically injured burn patient, considering: |
  | - SIRS, sepsis, multiple organ failure |
  | - Gastrointestinal (GI) effects (stress ulceration, ileus, malabsorption, etc.) |
  | - Immunologic problems (immunosuppression) |
  | - Cardio-respiratory effects |
  | - Extremity and Abdominal compartment syndrome(s) |
| e. Manage treatment of inhalation injury: |
  | - Flexible bronchoscopy |
  | - Naso- or oro-tracheal intubation, tracheostomy (airway management) |
  | - Ventilator management (prevention of baro-/volu-trauma, prevention and treatment of ARDS) |
  | - SIRS management (corticosteroids, antioxidants, etc.) |
| f. Manage carbon monoxide poisoning |
  | - Recognition of (dangerous) cardiac and CNS complication |
  | - Monitoring of CO levels, EKG, neuro-status |
  | - (Hyperbaric-) Oxygen therapy |
| g. Manage wound therapy, including: |
  | - Selection and application of appropriate dressings and topical antibacterials |
  | - Tangential and fascial excision, debridement of deep tissues |
  | - Skin graft harvest and application |
| h. Manage electrical burns, including: |
  | - Entrance and exit wound care |
  | - Recognition and management of cardiac, vascular, neurologic, ophthalmologic effects and deep tissue destruction and rhabdomyolysis |
| i. Manage chemical burns, including: |
  | - Identification of types and sources of chemicals (potentially) involved |
  | - Management by dilution or neutralization, and decontamination of the patient |
  | - Treatment of systemic effects of local chemicals |
### Wound management

**j. Manage eschar, compartment syndromes and chronic contracture:**
- Techniques of escharotomy, fasciotomy, scar revision
- Techniques of hypertrophic scar prevention/non-operative therapy

**k. Manage the burned child,** including:
- Initial therapy, systemic support and special care needs with input from the pediatric intensive care team, including child abuse, social work and other child-specific services

- Under supervision by the senior Burn Surgery resident, experienced Burn Surgery mid-level provider(s) and attendings, manage post-operative surgical complications, including wound and systemic infection, skin graft failure, SIRS, sepsis and organ failures(s), compartment syndrome, rhabdomyolysis, etc.
- Attend **Burn Surgery clinic** at least once a week and under-on-one supervision by the Burn Surgery attending, participate in the evaluation of patients in the office setting.

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### Medical Knowledge:

**Goals:**
Residents must demonstrate knowledge about established and evolving biomedical, clinical and cognate (e.g. epidemiological and social-behavioral) sciences and the application of this knowledge to patient care.

**Objectives:**
At the end of the Burn Surgery rotation, the resident should be able to:

- Demonstrate knowledge of the concepts and principles of burn injury and pathophysiology (skin, deeper tissues, inhalational, electrical, etc.) and apply them to the comprehensive care, including the evaluation, resuscitation, clinical management and rehabilitation of the acutely injured burn patient.
- Review the epidemiology, prevention, and socioeconomic and psychologic effects of burns.
- Describe the histology and functional anatomy of the skin, adnexae and subcutaneous tissues.
- Outline the physics and dynamics of thermal injury and the progression of tissue damage.
- Perform a burn-related focused history and exam that assesses the extent and grade of burn injuries, involvement of joints, face, genito-urinary areas and potential for inhalational (airway and pulmonary thermal and chemical injury) and (electric) cardiac injury; assess for potential factors that will complicate the management of the burn.
patient (extremes of ages, comorbid conditions affecting cardio-pulmonary reserve, immune system, nutritional state, etc.).

- Assess the **appearance of the burn wound** in relation to its depth, bacteriologic condition, healing potential and requirement for operative intervention; describe the relationship between burn depth and degree of the burn.

- Discuss an **initial treatment plan** for stabilization and fluid resuscitation of a burned patient based on the above evaluation:
  a. Airway/breathing assessment and support
  b. Crystalloid/colloid resuscitation, Parkland formula, early goal directed therapy (use of invasive monitoring); define the “Rule of Nines” as it relates to total body surface area of the burn and resuscitation parameters
  c. Initial wound management to prevent bacterial contamination, reduce secondary expansion of the burn damage and reduce pain
  d. Management of (early) organ failure(s)

- Describe the **clinical factors necessitating immediate/urgent intervention** to preserve life, limb and function (P’s of compartment syndrome, bleeding, rhabdomyolysis, etc.).

- Outline the **principles of burn shock, immunologic and metabolic alterations in burn patients, and bacteriologic pathology (early vs. late) of burned skin**; analyze the **principles of systemic and local antibacterial agents** in the burn wound.

- Review the basic **principles and controversies concerning the management of the burn wound**, and describe a clinical plan for its care:
  a. Conservative care for superficial wounds
  b. Early / aggressive vs. late conservative debridement / grafting for deeper burns
  c. Escharotomy, fasciotomy
  d. Describe the indications, techniques for harvest, application, immobilization, and care of split- and full-thickness skin grafts (auto-graft)
  e. Describe the indications, techniques for application, immobilization, and care of human cadaver (allo-graft) and porcine grafts (xeno-graft), as well as cultured epidermis (Appligraf)

- Explain the special circumstances created by **electrical, chemical and inhalation burn injury**, and apply their relation to the management of the burn patient.

  **Inhalational injury:**
  a. Thermal injury to airway and lungs
  b. Chemical injury to airway and lungs
  c. Carbon monoxide poisoning (cardiac and CNS effects)
  d. Use of steroids, antibiotic therapy, airway management and ventilator support, use
of hyperbaric oxygen therapy, decontamination of chemical burns
e. Relation of inhalation injury to pulmonary complications (ARDS, pneumonia, etc.),
morbidity, mortality and time course of patient recovery

Electrical burn:
Discuss the physics and pathology of the electrical burn and its relation to associated
organ injury, including:
a. Current: type, strength, length of exposure
b. Entrance and exit wounds
c. Deep tissue involvement
d. Neurological injury
e. Cardiac and vascular problems
f. Rhabdomyolysis

• Describe the specific considerations and management of burns in:
  a. Hand
  b. Major joints
  c. Face
  d. Genito-urinary

• Explain the principles of wound contracture, and report desirable and harmful effects
  of contracture on initial management of the burn victim, methods to reduce/prevent/
  chronically treat contracture formation

• Review the indications for and contributions of (early) physical and occupational
  therapy and other adjunct therapy in burn patients; recognize the importance of a
  multi-specialty specialized burn team or unit in the overall management of the burn
  patient to include the following:
  a. Physical therapy
  b. Occupational therapy
  c. Psychological counseling
  d. Recreational therapy
  e. Burn nursing
  f. Cosmetics

• Describe the indications for, and basic techniques of, plastic and reconstructive
  intervention in the burn wound to alleviate:
  a. Scar contracture/underlying joint contracture
  b. Hypertrophic scar/cosmetic disfigurement

• Describe the specific psychosocial and injury specific (skin and healing, size of body
  regions, resuscitation needs and organ reserves, etc.) differences in pediatric burn
  patients and related need for specialized services and management.

Objectives – General:
### Practice-based Learning and Improvement:

- Complete the reading assignment (see literature list)
- Attend all (≥ 85%) conferences, M&M conferences, Grand Rounds/other educational activities of the Department of Burn Surgery during the rotation
- Take a post-rotation self-assessment test with at least 75% correct answers

### Goals and Objectives:

Residents must be able to investigate and evaluate their patient care practices, appraise and assimilate scientific evidence, and improve their patient care practices. Residents are expected to:

- **Self-assessment**: Analyze practice experience during the rotation, as well as own performance-based on interaction with Burn Surgery fellow, attending(s) and other key Burn Surgery staff; accept and use constructive criticism to improve performance in the six core competencies.

- **Medical knowledge**: Self-directed and under mentorship of Burn Surgery fellow and attending staff, locate, appraise and assimilate evidence from scientific studies related to their patients’ health problems; Use evidence based medicine approach to patient care whenever possible; apply knowledge of study designs and statistical methods to the appraisal of clinical studies and other information on diagnostic and therapeutic effectiveness; use information technology to manage information, access on-line medical information and support their own education; facilitate the learning of students and other healthcare professionals on the Burn Surgery service by sharing pre-existing and newly acquired knowledge (general and case-based) on rounds and during formal educational activities. Residents are encouraged to ask/question the Burn Surgery fellow, attending staff and/or other Burn Surgery surgery related expert providers for clarification of unclear concepts/practices at any time.

- Participate in the **peri-operative management of burn patients** in the inpatient and outpatient setting as outlined in the patient care competency. During the rotation the resident should become familiar / proficient with:
  a. Fundamentals of burn patient history and exam; burn/trauma-related diagnostic tests and procedures in adult and pediatric patients (see also Trauma Rotation Goals and Objectives)
  b. Fundamentals of thermal, electric and chemical burn management in adult and pediatric patients
  c. Common complications in burn patients and management thereof

- Perform/participate in **Burn Surgery service related operations** as outlined in the patient care competency; during the rotation the resident should become familiar/proficient with: wound care, debridement, skin grafting, escharotomy,
## Interpersonal and Communication Skills:

**Goals and Objectives:**
Residents must be able to demonstrate interpersonal and communication skills that result in effective information exchange and teaming with patients, their patient’s families, and professional associates. Residents are expected to:

- Develop interpersonal skills necessary to **communicate effectively** with patients, patient families, nursing staff, mid-level healthcare providers, ancillary staff, medical students, fellow residents and attending staff in the complex multi-specialty environment that constitutes Burn Surgery.
- Contribute to **creating an atmosphere of collegiality and mutual respect** with all providers involved in the care of patients.
- Develop **effective listening, questioning and documentation skills**.
- Demonstrate **ability to work effectively as a member of a team**.
- Demonstrate **ethically sound behavior** (see also Professionalism).
- Share **personal knowledge** with other members of the team to foster an environment of learning.

## Professionalism:

**Goals and Objectives:**
Residents must demonstrate a commitment to carrying out professional responsibilities, adherence to ethical principles and sensitivity to a diverse patient population. Residents are expected to:

- Demonstrate **adherence to institutional and departmental standards and policies**.
- Demonstrate **respect, compassion, integrity and ethical behavior** consistent with the values of the department, institution and Johns Hopkins University School of Medicine; develop and sustain sensitivity toward differences of age, gender, culture, religion, ethnicity or other diversities in both co-workers and patients.
- Demonstrate ability to appropriately take on, **share and delegate responsibilities** with respect to patient care; balance own rights and privileges appropriately with responsibilities and accountability resulting from being a member of a team dedicated to patient care.
- Demonstrate **commitment to excellence and on-going professional development**.
- Under attending and other Burn Surgery staff guidance develop skill **to resolve potential problems and conflicts that occur in a complex corporate environment** using the appropriate channels and methods of communication to maximize patient care and surgical service performance.
- Evaluate and formulate a response to **ethical questions**, including:
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<th>Systems-based Practice:</th>
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<td>a. Resuscitation of patients with high mortality extensive burns vs. comfort care?</td>
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**Goals and Objectives:**

Residents must demonstrate an awareness of and responsiveness to the larger context and system of healthcare and the ability to effectively call on system resources to provide care that is of optimal value. Residents are expected to:

- Understand how choices in patient care and other professional practices affect other healthcare professionals, the healthcare organization and the larger society and how these elements of the system affect their own practice
  
a. Average cost of burn care and rehabilitation in relation to percent surface area burned, functional areas involved (face, hand, joints, etc.) and other factors
  
b. Understand the relevance and components of clinical pathways and how to deal with deviation

- Practice cost-effective healthcare and resource allocation that does not compromise quality of care

- Know how to partner with healthcare managers (Burn Surgery coordinator, social work, case management, PT/OT and Rehabilitation medicine, etc.) and other health care providers (PMD, specialty providers in and out of the hospital) to assess, coordinate and improve healthcare for the individual patient and cohorts of patients.