

Surviving the Unsurvivable: Optimal Clinical and Claims Outcomes in Severe Burn Cases

PARADIGM®

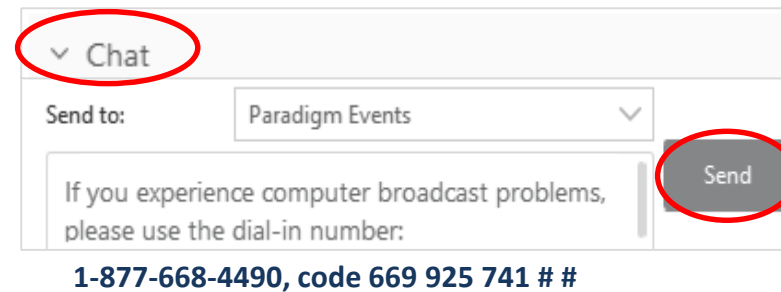
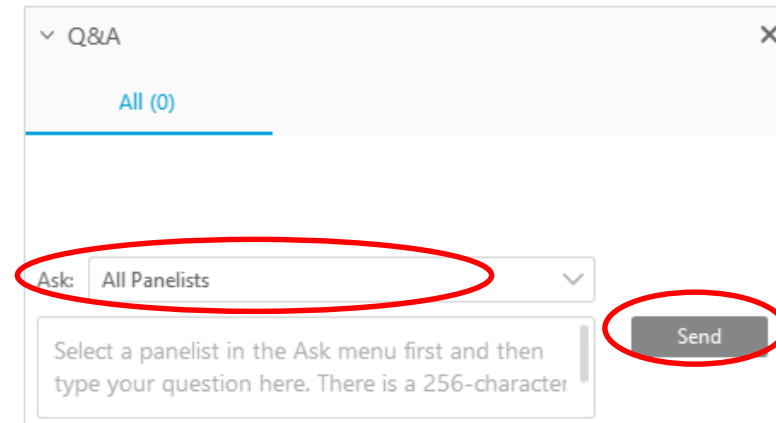
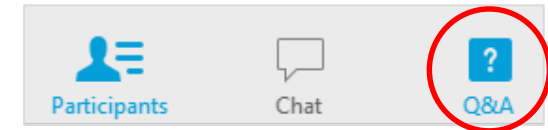
OUTCOMES

Jeffrey Saffle, MD, Paradigm Medical Director

Margaret Aslakson, RN, MSN, CCM, Paradigm Director of Clinical Services

First, a Few Housekeeping Points

- Slides advance automatically
- Question and Answer period at end
- Submit questions at any time
 - Q&A panel is on the lower right side (If you don't see it, click the "Q&A" button in the upper right)
 - Type a question into the lower section of the Q&A panel that appears
 - Ask "All Panelists" and click "Send"
- A copy of the presentation is posted at paradigmcorp.com/webinars; a copy of the replay will also be emailed
- **In order to receive CCMC credit**, after the closing comments, close out of the WebEx window. Two windows will pop up with 1) the WebEx feedback survey and 2) the **CCMC credit survey**. Upon completion of the CCMC survey, you will be redirected to a copy of the CCMC Verification of Completion certificate.
- If you experience computer broadcast audio problems, please use the dial-in number posted in the Chat panel



Our Speakers Today

Margaret Aslakson, RN, MSN, CCM
Paradigm Director of Clinical Services



Jeffrey Saffle, MD
Paradigm Medical Director



- Coordinates implementation of Paradigm's Systematic Care ManagementSM model and oversees case, clinical and financial management to achieve optimal outcomes
- Past roles include VP of Case Management Services at Cigna's Intracorp and GAB Robins-MedInsights and VP of Operations at Managed Comp
- Board-certified case manager and a member of the nursing honor society Sigma Theta Tau, the Academy of Certified Case Managers and the Case Management Society of America

- MD with specialty in burn surgery and rehabilitation
- Served as director of the Burn-Trauma Intensive Care Unit and director of the Department of Telemedicine for the University of Utah Health Center
- Past chairman of the American Burn Association's Multicenter Trials Group; currently serves on the Medical Advisory Board of the Shriners Hospitals of North America
- Recipient of the University of Utah Distinguished Teaching Award, as well as the American Burn Association Harvey Stuart Allen Award

Today's Learning Objectives

1. Organize effective case management strategies enabling optimal catastrophic claims outcomes.
2. Summarize how medical advancements increase survival rates and prolong life expectancies.
3. Determine the interventions to be provided during the rehabilitation phase of recovery from severe burns and their impact on return to work.

Defining Severe Burn Injury

A catastrophic burn injury is a serious, life-changing event that involves

- Greater-than 20% total body surface area
- Full or partial thickness burns
- Cross major joints or involve hands, face, feet, or perineum

(-Kucan et al, Journal of Burn Care 2010)

- Burns may be classified as flame/heat, electrical, chemical, frostbite, radiation
- Long-term outcomes require comprehensive and active follow-up over a period of several years
- Co-morbid diseases or dual diagnosis at time of injury directly impact the level of ultimate recovery

Team Approach to Acute Management of Severe Burns

- **Multidisciplinary teams within a burn unit may include:**
 - General and reconstructive/plastic surgery
 - Pulmonology
 - Critical care
 - Infectious disease specialist
 - Certified burn care nurses
 - Physicians assistants/nurse practitioners
 - Social workers, physical and occupational therapy, clinical psychology, ophthalmology, pharmacology

- **External team is also important for successful outcomes:**
 - Employer
 - Third Party Administrator
 - Worker's Compensation carrier
 - Injury management provider
 - Family



**Managing the Clinical Challenges
of Catastrophic Burns**

Illustrating Innovations and Challenges With Two Cases

- Recent progress in burn treatment
- Innovations in care
- Continuing challenges in treatment and rehabilitation
- Management strategies for coverage providers





Mr. P's Story

Mr. P's Story

Injury

- Male, 24, injured 2016
- He was filling a power washer with gasoline which ignited
- Taken to a local hospital, then air-evacuated to a large regional burn center

On arrival

- Intubated for airway protection/control
- Burns to **67% TBSA**
 - 58% full-thickness to chest, abdomen, back buttocks, bilateral arms, forearms, hands, thighs
 - 9% partial-thickness to face, neck, upper arms, genitalia
- No other injuries identified

Mr. P's Story (Continued)

Hospital course

- Taken immediately for escharotomy of right hand, bilateral thighs
- Admitted to ICU with vent support, enteral nutrition, pain control, wound care, PT/OT, psycho-social support
- Extubated Day 3
- Six subsequent operations for burn excision and coverage with allograft, autograft, and epidermal replacement skin
- Discharged after 77 days (1.15 days/%burn)

Autologous Epidermal Spray: 80-fold Expansion



Source: ReCell is an investigational device in the United States and limited by U.S. law to investigational use. Images used with permission of Avita Medical.

Skin Grafting Results



Used with permission

Mr. P's Story (Continued)

At discharge

- Transferred to Inpatient Rehab for 3 weeks
- Then discharged to live with his brother
- Outpatient wound care, PT, OT, pain management established
- Referred to a psychologist for concern of PTSD

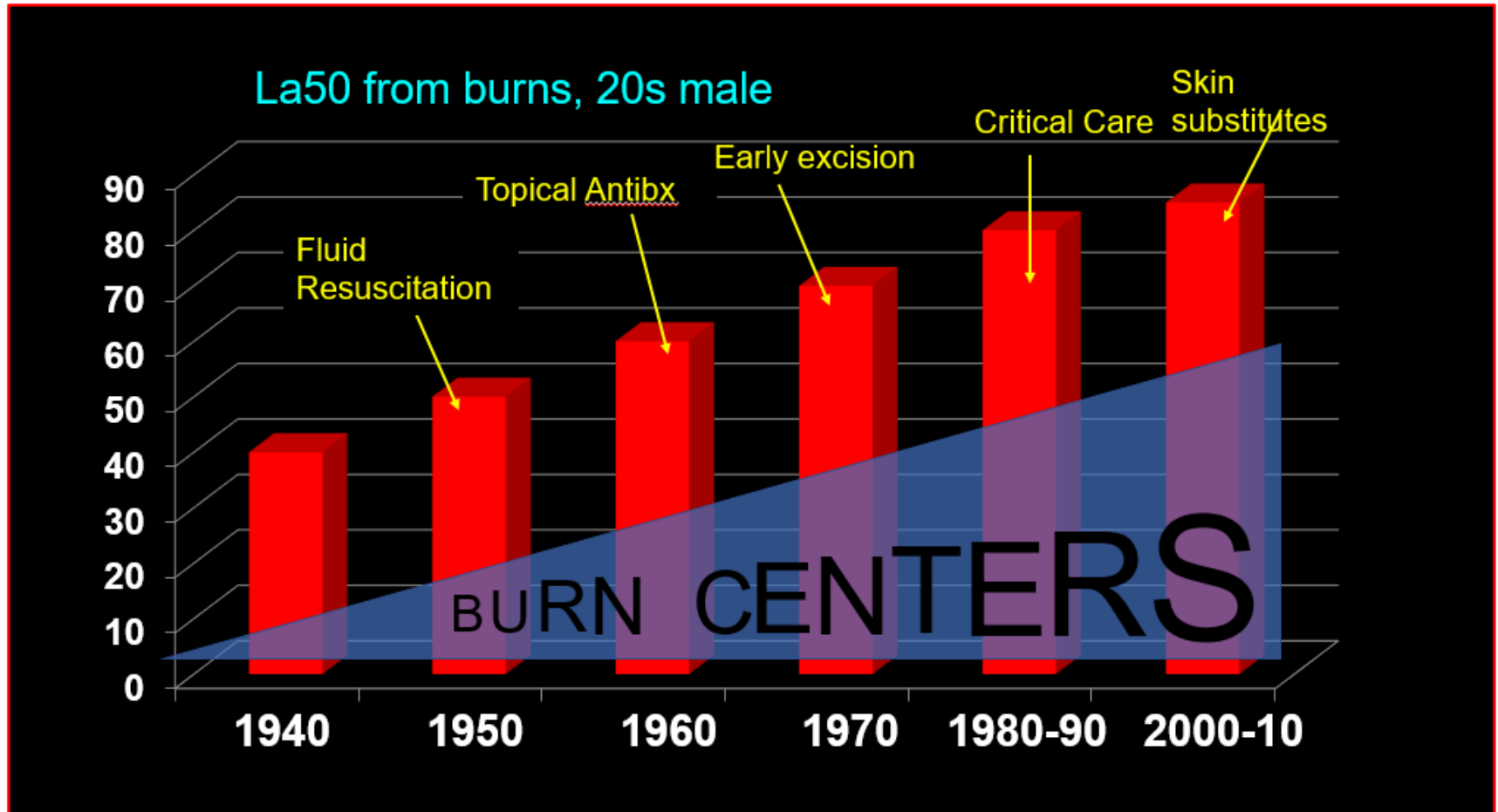
Over the next 7 months

- Regular follow-up with a psychologist
- Improved pain control and sleep
- Rapid progress with therapy: began a gym membership 6 months after injury
- Discharged from PM&R 8 months after injury
- Plans for laser treatments to begin one year post-injury
- Patient will almost certainly return to work

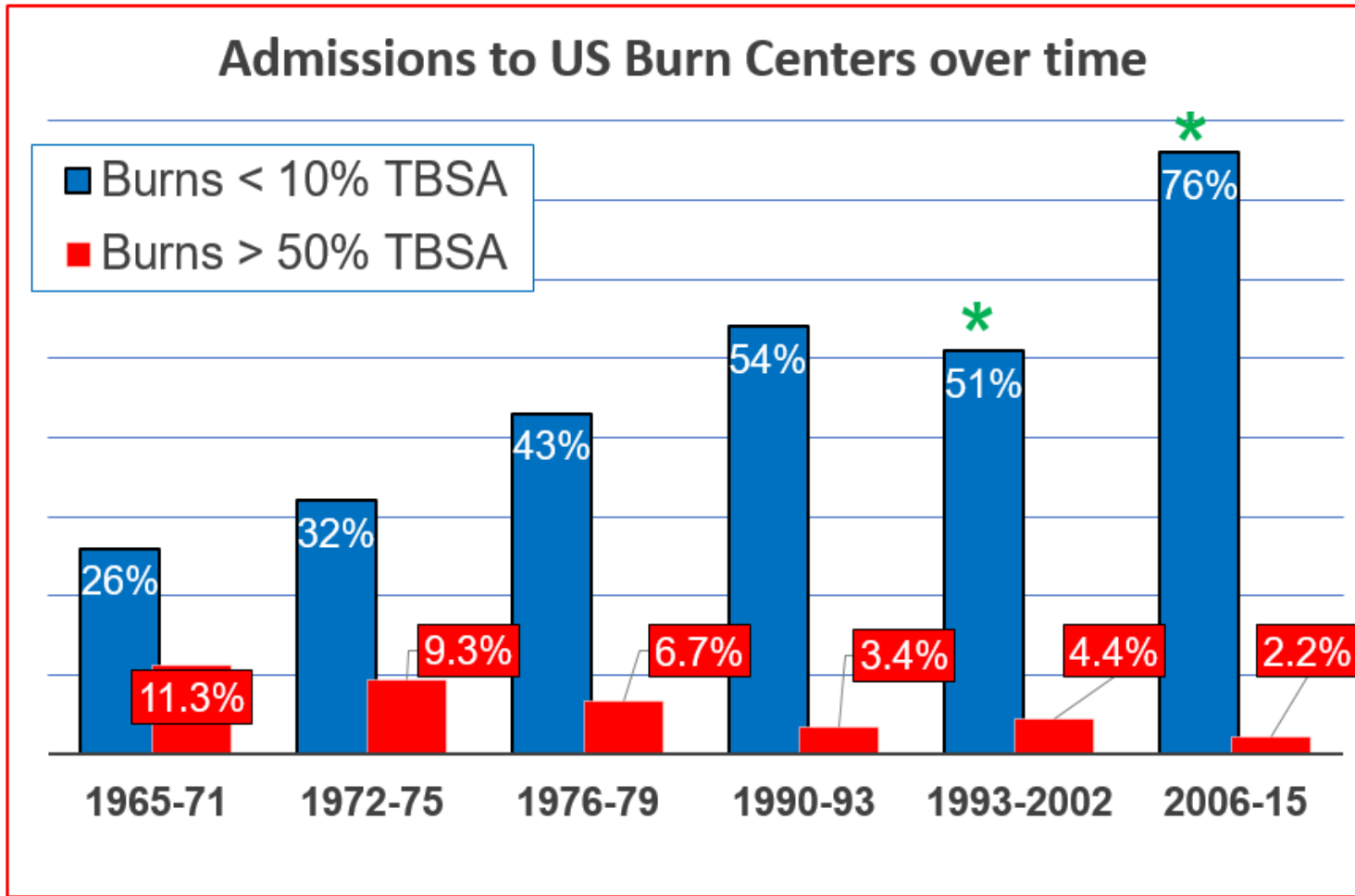


**Burn Centers and Improving
Survival Rates**

Improving Survival From Major Burns



Percent of total admissions



* Data from National Burn Repository, 2006-2015, n = 177,498



**Changing Demographics and
Their Impact on Clinical Care**

Changing Demographics of Burn Injury in the U.S.

- Much better survival
- Fewer burns: 10/10,000 in 1971 vs 4.2/10,000 today
- Disproportionately fewer **big** burns
- 25% fewer burn centers since 1980: 65 verified centers in US/Canada
- More specialization industry-wide

What Do These Changes Mean for Clinical Care?

- Almost all burn care is concentrated in remaining burn centers, which now cover much larger areas
- The only extensive experience is in burn centers
 - Especially for **big** burns
 - Burn centers' major impact is in smaller injuries
 - A **small** burn is not necessarily a **minor** burn
- Much more emphasis on **rehabilitation**, which is increasingly
 - Complex/specialized
 - Prolonged
 - Expensive
- With comprehensive rehab, outcomes are surprisingly good ... and expected!



Mr. M's Story

Mr. M's Story

- Male, 45, driver of a propane truck involved in MVA
- Self-extricated; taken to a local hospital, then air-evac to regional burn center
- On arrival: Intubated; burns **35% TBSA** all full-thickness to bilat arms/hands, back, buttock, bilat legs, L foot
- Lacerations to face, degloved ear
- PMH remarkable for asthma, obesity
- Evidence of inhalation injury: Carbonaceous sputum, thick secretions

Mr. M's Story (Continued)

- Admitted for fluid resuscitation, vent support, wound care, nutrition, pain control
- Taken immediately for fasciotomy left upper extremity
- Taken to surgery 5 days post-injury: Suffered severe hypotensive/hypoxemic episode with subsequent multiple organ failure:
 - **Renal:** Dialysis required for 36 days
 - **Liver:** Elevated enzymes gradually resolved
 - **Pancreatitis**
 - **Respiratory failure:** Tracheostomy, 33 days vent support
 - **Sepsis:** Wound and pneumonia, multiple organisms

Mr. M's Story (Continued)

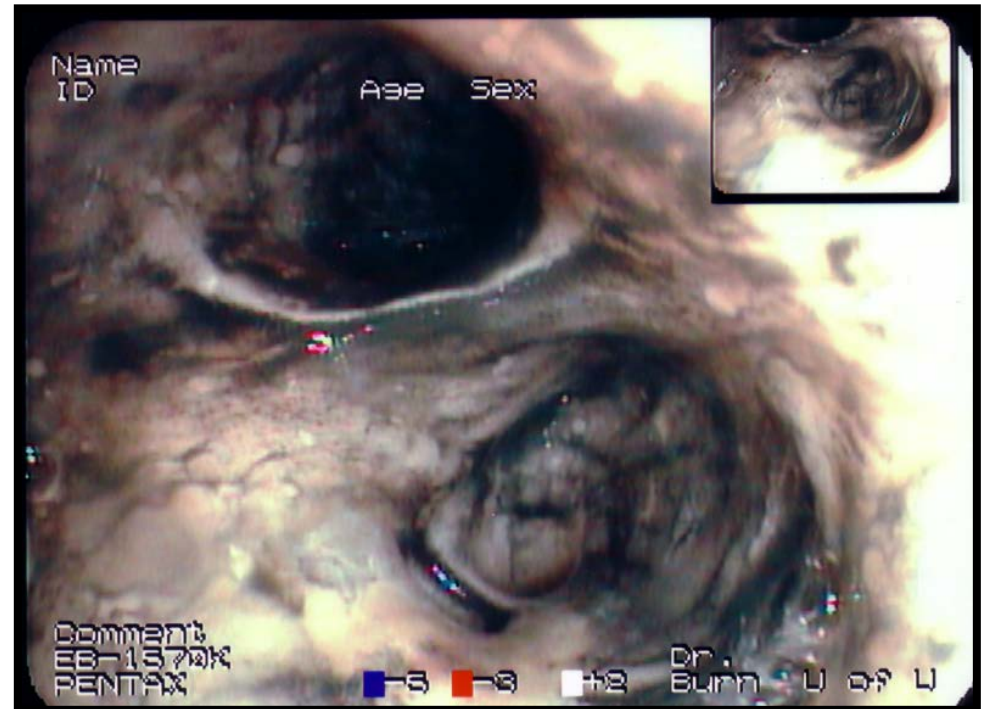
- 55 days inpatient
- 17 operations for bronchoscopy, tracheostomy, wound coverage: Excision, allograft, autograft
- Prolonged vent weaning and breathing trials
- Enteral nutrition
- Discharged to inpatient rehab: 15 days (total 2.0 days/%)



Mr. M's 3 Challenges

1. Inhalation Injury

- A chemical injury to the small airways
- Accompanies flame injury
- Manifested by wheezing, shortness of breath, carbonaceous sputum
- Definitive diagnosis with bronchoscopy
- Occurs in 7-8% of severe burns
- Doubles mortality for many groups
- Long-term complications are unusual



2. Effective Resuscitation

- Intravascular volume loss is massive
- Effective resuscitation is now mostly successful, sometimes with computer algorithms
- Blood pressure is supported by increased adrenergic (epinephrine) tone
- General anesthesia removes this support; patients risk crashing
- Prone positioning is risky: Mucous plugs, ET tube slipping, etc.

3. Wound Coverage in Multi-System Organ Failure

- Renal/liver failure greatly impede wound healing
- Episode of hypotension made everyone nervous: Subsequent operations were more limited (17 ORs vs 6 for Mr. P).
- Multiple treatments with allograft (cadaver skin) before autografting.
- Severe hypermetabolism required prolonged enteral nutrition

Mr. M's Subsequent Course

- **Wounds**
 - Entirely grafted, gradual healing
 - Compression garments, scar massage, moisturizers
 - Six laser treatments beginning 5 months after injury
- **Pulmonary**
 - Continued complaints of shortness of breath
 - Pulmonary function tests revealed severe permanent COPD
 - Inhalers, nebulizers
 - Exercise tolerance remains limited
- **Renal, GI challenges have resolved**

Mr. M's Subsequent Course (Continued)

- Psychiatric: PTSD
 - Medications gradually tapered, ongoing counseling
 - Many contacts with nurse case manager
- Activity remains limited, attends local gym for light exercise
- Community reintegration achieved
- RTW status: 67% impairment, “not interested” in vocational rehab
- Contract achieved 19 months after injury

Mr. M and Mr. P are Success Stories

- **Mr. P:** Big burn, relatively smooth hospital course, excellent rehab
- **Mr. M:** “Only” 35% TBSA, multiple life-threatening complications, prolonged rehab with limited recovery
- Both required
 - 18+ months of case management
 - Treatment for PTSD
 - A lot of input from nurse case managers
- Both benefited greatly from supportive families



Why Does Rehabilitation Take So Long?

Wound Healing

- Initial 6-8 months: Early scar growth and hypertrophy
- Then scars begin to flatten and soften for another 6-8 months
- Skin is dry, fragile, and rigid, requiring moisturizers and sun protection to prevent breakdown
- Intolerance to temperature extremes is the norm, and greatly impacts return to outdoor activities.

Scar Management

- Continued aggressive stretching and PT
- Moisturizers, careful skin management
- Adjunctive treatments include
 - Compressive garments for 12-18 months
 - Topical and injected steroids
 - Radiation
 - Vitamins
- Redness fades as scars finally mature. Only then is reconstructive surgery most effecting: hands, faces, joints
- New and promising: lasers

How Does Fractional Laser Work?



Source: Photo courtesy of Dr. Robert Sheridan, Shriners Hospital, Boston

Laser Therapy for Burn Scars



17 year old female, 50% TBSA burn, PDL x 5,
CO2 x 3 shown 39 months after treatment

Source: Used With Permission: Hultman, CS et al, Ann Surg, 2014;260:519

Metabolism

- The most severe catabolism known, with obligatory muscle loss.
- Persists for months after injury.
- Severe deconditioning accompanies hospitalization as well as rehabilitation.
- Aggressive PT/OT is essential to prevent contractures as well as improve strength/endurance.

Psychosocial Challenges

- Profound alteration of body image
- Social stigma, anxiety, loss of income, family stress
- PTSD is especially common and severe (25-45%)
- Pre-existing psychiatric/substance abuse is all too common
- Therapy is lengthy, expensive, and often not readily available
- These particularly complicate return to work

Why Are Burn Centers So Important?

- Increasingly, the only repository of expertise – especially for large injuries
- Unique multi-disciplinary organization. Throughout rehabilitation patients need surgery, PT, OT, pharmacy, social work, psychology, etc.
- ABA/ACS program verifies resources, personnel, training, volume, experience, research, data collection to provide and document optimal care for burn patients
- 123 self-reported burn centers in U.S./Canada; about 65 are verified
- Surgery is the easy part. Coordination and follow-up are much more difficult.



**Maximizing Case Management and Managing
Exposure and Reserves**

Rehabilitation and Recovery

- Management and prevention of long term complications

- Skin protection and scar management
 - Lotions/creams
 - Sunblock
 - UV blocking clothing
 - Paraffin

- Temperature regulation
 - Fans
 - Heaters
 - Air conditioning

Rehabilitation and Recovery

- Joint mobility
 - Home exercise program
 - Therapies
 - Surgery
- Psychological support for
 - PTSD
 - Depression
 - Anxiety
 - Adjustment to disfigurement
- Community resources and family involvement

Return to Work After a Severe Burn Injury

- Long-term physical and psychological sequelae can exist for decades
- Pre-existing problems at work likely to be magnified when the individual attempts to return to work
- “The interplay of physical, psychological and environmental factors affecting return to work is not well known.”
(-Oster et al. Journal of Burn Care and Research, 2010)
- Suggested modifications in the workplace
 - Temperature regulation
 - Clothing
 - Modified duty
 - Protection
- Employment interrupted with surgeries/recovery time accommodations, indoor vs outdoor work

Reminder Regarding CCMC Credit

In order to receive CCMC credit, **after the closing comments, close out of the WebEx window.**

Two surveys will pop up: 1) the WebEx feedback survey and 2) the CCMC credit survey.

Upon completion of the CCMC survey, you will be redirected to a copy of the CCMC Verification of Completion certificate.

If the CCMC survey does not pop up, you may access the survey from:

<https://www.surveymonkey.com/r/severeburns>

Tip: If your work computer has blocked Survey Monkey, access the link via your home computer.

Question and Answer Session

Submit your questions in the Q&A panel on the right of your screen.

Margaret Aslakson, RN, MSN, CCM
Paradigm Director of Clinical Services



Jeffrey Saffle, MD
Paradigm Medical Director



Experiencing computer audio broadcast problems?

Please use the toll-free dial-in number: 1-877-668-4490, access code 669 925 741 # #



Follow Paradigm on Facebook: www.facebook.com/ParadigmOutcomes



Follow Paradigm on Twitter: www.twitter.com/ParadigmSays



Find informative videos on our YouTube channel: www.youtube.com/paradigmoutcomes



Read Outlook on Outcomes, Paradigm's blog: www.paradigmcorp.com/blog