



# Investigating Loss to Follow up for Outpatient Burn Care

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## Background

- Patients with burn injuries are a vulnerable population, requiring a multidisciplinary, highly skilled team for the appropriate level of care and optimal outcomes
  - Evaluation and treatment by providers trained in burn care prevents over and undertreatment
    - *Overtreatment*: unnecessary patient transport, high costs, and poor resource allocation
    - *Undertreatment*: challenges estimating full extent of inhalation injuries, incorrect fluid resuscitation, poor wound healing leading to loss of function
- Major challenges exist in access to care for patients across large geographic areas
- Technological advances in medicine appear useful in burn care
  - Telehealth connects burn care providers with patients across large geographic areas
  - Mobile apps are useful in triaging burn injuries for appropriate initial treatment, transfer, and follow up through use of pictures of injuries
- In Colorado, the *Burn app* is utilized by providers across the state for direct consultation with burn surgeons at the burn center to safely send encrypted photos via their phone
  - In Colorado Springs patients with burn injuries have low levels of compliance after recommended follow up through the *Burn app*
    - Less than ½ of the patients follow up at the regional burn center as recommended
    - Almost ¼ followed up at local Emergency Departments and clinics for further burn care

## Aim Statement

- We endeavored to further investigate the barriers patients face in order to participate in recommended outpatient burn care follow up
  - We hypothesized that some patient likely have challenges accessing care due to social circumstances
  - Patients would be less likely to schedule and/or comply with follow up instructions after discharge from the Emergency Department

## Program Description

- Retrospective review over a 2 year period
  - Included patients seen at 2 Emergency Departments 60-75 miles away from the Anschutz Medical Campus burn center (Memorial Central and Memorial North) in Colorado Springs
  - Patient included in our cohort had outpatient recommendation for their burn injury after consultation via the *Burn app*
- Medical record review
  - Determination of follow up; demographic characteristics; burn size, location, etiology

## Program Evaluation

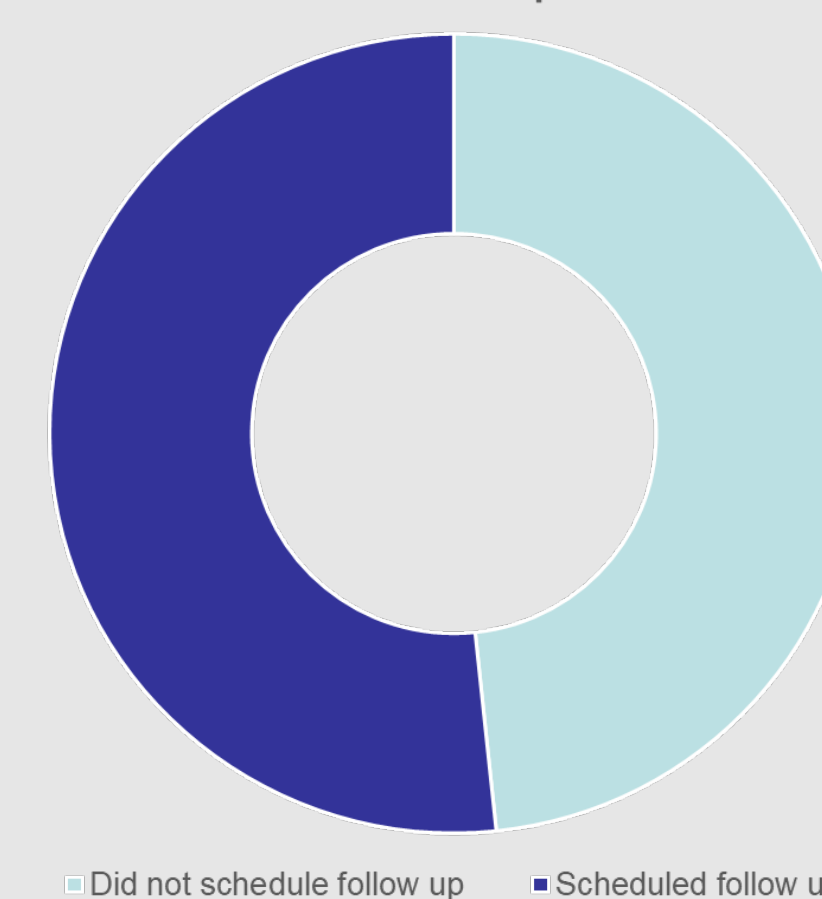
Table 1: Demographic Features of Patients with Burn Injuries

	Overall (n=60)	Did not follow up (n=34)	Followed up (n=26)	p-value
<b>Male gender</b>	40 (67)	27 (79)	13 (50)	0.03
<b>Age in years</b>	35 [27, 51]	38 [28, 55]	30 [25, 46]	0.10
<b>Race/ethnicity</b>				0.30
-Non-Hispanic White	42 (70)	26 (77)	16 (62)	
-Black	9 (15)	4 (12)	5 (19)	
-Hispanic	7 (12)	4 (12)	3 (12)	
-Asian	2 (3)	0 (0)	2 (8)	
<b>Homeless/institutionalized</b>	6 (7)	6 (18)	0 (0)	0.03
<b>Insurance type</b>				0.09
-Private	15 (25)	7 (21)	8 (31)	
-Medicaid/Medicare	26 (44)	14 (41)	12 (46)	
-None	10 (17)	9 (27)	1 (4)	
-Worker's compensation	5 (8)	1 (3)	4 (15)	
-Other	4 (7)	3 (9)	1 (4)	

Table 2: Follow up Compliance and Burn Injury Features

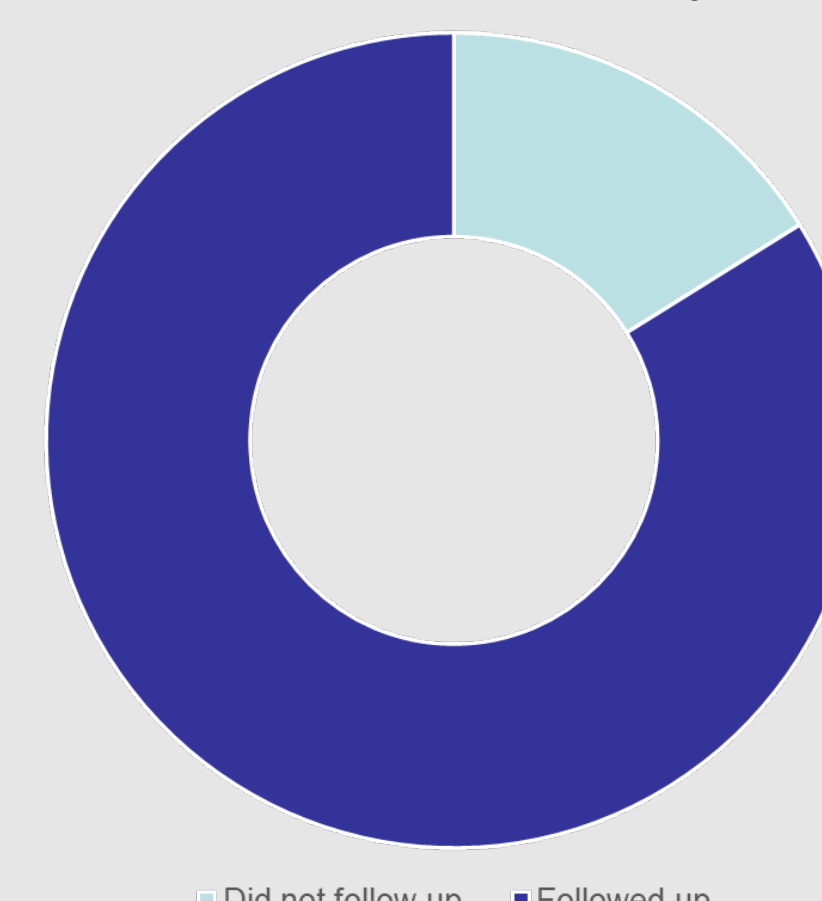
	Overall (n=60)	Did not follow up (n=34)	Followed up (n=26)	p-value
<b>Scheduled follow up</b>	31 (52)	5 (15)	26 (100)	<0.001
<b>Etiology</b>				<0.001
-Scald	24 (40)	6 (18)	18 (69)	
-Flash/flame	20 (33)	17 (50)	3 (12)	
-Contact	8 (13)	6 (18)	2 (8)	
-Other	8 (14)	5 (15)	3 (12)	
<b>TBSA &lt; 1%</b>	43 (72)	22 (65)	21 (81)	0.24
<b>Facial burns</b>	13 (22)	11 (32)	2 (8)	0.05
<b>Incident occurred at home/work</b>	38 (63.3)	12 (35.3)	26 (100.0)	<0.001
<b>Follow up in local clinic/ED</b>	11 (18)	8 (24)	3 (12)	0.40

Recommended for outpatient follow up



Did not schedule follow up Scheduled follow up

Scheduled follow up



Did not follow up Followed up

Memorial ED Burn Pt Follow Up Call Script

My name is Allison Moore and I am a medical student from the University of Colorado calling on behalf of the Burn Center at Anschutz Medical Center.

I see that you were recently seen at the Memorial Emergency Department for a burn injury on \_\_\_\_\_

How are you feeling and how are you doing with wound care?  
 Urgent conditions -> make sure that they plan to call the burn clinic or go to the emergency room  
 Fever  
 Redness spreading at site of injury  
 Nausea/vomiting  
 Severe uncontrolled pain  
 Cannot manage wound care

I see in our notes that we wanted to see you at the Burn Center clinic in Aurora to follow up after your visit to ER.  
 Have you been able to set up an appointment?  Yes  No

Was there anything that made it challenging for you to set up an appointment?  
 Unaware of need  
 Didn't have contact information  
 Transportation  
 Time off work  
 Money/financials  
 Aware of need, don't see the importance/feel better  
 Followed up elsewhere  
 Other (notes):

The Burn Center uses MyHealth connection, which is an online portal used by the whole hospital, to help you make appointments and see results.  
 Would you like help setting that up now?  
 Yes  No

Setting up MyHealthConnection app  
 Step 1: Sign up for an account here  
<https://mychart.uchealth.org/mhcweb/register.aspx>

Step 2: Answer the questions and create an account using your email address and date of birth, then click "Sign-up Now."



## Discussion

- Identified barriers to follow up included
  - Male sex, burn etiology, being institutionalized, and likely resource access such as transportation
- Patients who scheduled an appointment were likely to show up to their appointment and receive care
- Specific barriers to follow up were difficult to identify due to lack of documentation in the EHR
  - More information is needed about the specific barriers that prevent patients in Southern Colorado from achieving the recommended follow up care
    - Examples: transportation, institutionalization, feeling the wounds were healing

## Future Steps

- Emergency Department recommendation of burn outpatient appointment alone is **insufficient** for comprehensive burn care to a regional burn center
- Enhancing telemedicine in addition to assistance with scheduling and transportation will likely better care for burn patients otherwise lost to follow up
- We have produced a call script to contact patients with recent burn injuries that will serve two functions:
  1. Help connect patients with the burn center/resources in addition to seeing how their wound is healing
  2. Collect further data regarding barriers to accessing care for the Colorado Springs/Southern Colorado population

## Reference

1. Carmichael, H., Dyamenahalli, K., Duffy, P. S., Lambert Wagner, A., & Wiktor, A. J. (2020). Triage and Transfer to a Regional Burn Center—Impact of a Mobile Phone App. *Journal of Burn Care & Research*, 41(5), 971-975.
2. Carmichael, H., Wiktor, A. J., McIntyre, R. C., Wagner, A. L., & Velopoulos, C. G. (2019). Regional disparities in access to verified burn center care in the United States. *Journal of trauma and acute care surgery*, 87(1), 111-116.
3. Wiktor, A. J., Madsen, L., Carmichael, H., Smith, T., Zanyk, S., Amani, H., & Wagner, A. L. (2018). Multiregional utilization of a mobile device app for triage and transfer of burn patients. *Journal of Burn Care & Research*, 39(6), 858-862.