Telemedicine for Regional Burn Care

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*No financial disclosures. No support of any product is implied
Objectives

1. Understand the restrictions on access to specialized burn care due to
   A. Declining incidence of burn injury
   B. Decreasing number of burn centers
   C. Lack of physician training and awareness about burns

2. The ability of telemedicine to extend burn care expertise in both acute and followup situations

3. The value of portable device-based store and forward technology in consultations and other applications in burn care

4. The extension of these concepts to other specialties practices.
My Assumptions:

1. You already know a lot about telemedicine
2. You don’t know much about burn care
3. You’re professionals and can stand (a few) gruesome photos
There is NO team like the burn team!!
Annual Statistics
University of Utah Burn Center

Admissions: 300-400
Outpatient visits: 5,000 - 6,000
Burn Size Mean: 6% TBSA
LOS Mean: 6.0 days

Out of State: 37%
Children (< 18): 36%
Non-burn injuries: 31%
Two Recent Referrals:

Patient One:

* Called by an ER physician from a remote small town
* 60 year-old man burned fighting a garage fire: face, scalp, hands.
* Estimated 15% TBSA
* Facial burns “extensive”; considered intubation
* Transported to Salt Lake City
Patient One

Facial “burns” washed off

My estimate: 3.5% TBSA
### Patient ONE- Hospital Course

1. Dressed within 10 minutes.

2. 48 Hours in hospital waiting for his family to come get him.

3. Charges (2005):

<table>
<thead>
<tr>
<th>Service</th>
<th>Charge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital</td>
<td>$4,784</td>
</tr>
<tr>
<td>Surgeon (me)</td>
<td>$166</td>
</tr>
<tr>
<td>Air Transport</td>
<td><strong>Now $24,000+</strong></td>
</tr>
</tbody>
</table>
Patient TWO

1. Called by an ER Physician from a remote small town.
2. 60 year-old man burned priming a carburetor.
3. Burns “all over” face- should he intubate.
4. Took a photo with his CELL PHONE and sent it to me.
5. Advice on topical care given; patient and physician reassured.
Pearl Harbor, December 7, 1941

Burns already recognized as a major new problem in warfare (Blitz in England)

2,402 deaths*

1,282 wounded

60% of casualties were burns

*2,752 World Trade Center, 2001
Cocoanut Grove Fire, Boston, November 28, 1942

- 491 Deaths
- 400 + Injured
- Boston City Hospital
- MGH
- Both recipients of research awards for burns
- First burn center, first fluid resuscitation, first inhalation injury, etc.
Decreasing incidence of burn injury in the United States

10 burns/10,000 people

4.2 burns/10,000 people

* Data on fire, flame and scald/hot contact deaths by suicide, assault and undetermined intent unavailable until adoption of ICD-9 codes in 1979.

-- Brigham and McLoughlin, J Burn Care Rehabil, 1996;17:95
-- Burn Incidence Fact Sheet, American Burn Association
Changing Size of Admissions to US Burn Centers

Overall Survival 94.4%

Percent of Total Admissions

Burns ≤ 10% TBSA
Burns > 50% TBSA

1. Feller et al, National Burn Information Exchange
2. JBCR 1995;16:219 (n=6,400)
3. National Burn Repository, 2011; n > 140,000
As Survival has gotten better and burns have gotten rarer and smaller:

1. Focus is shifting toward **QUALITY** of life, and rehabilitation.

2. Focus is shifting on **Cost-effectiveness** of care in a changing health care landscape.

3. Much greater need for **partnerships** with local facilities to help optimize care for smaller burns.
25% Fewer Burn Centers in US/Canada in past 20 years!

-- ABA Directory of Burn Care Resources
Rotary Air Transport Service Areas for US Burn Centers

Burn Patient Air Transports, 2000-2001

Mean distance: 245 ± 135 air miles

LEGEND
- Star: Air Transport Service
- Circle: Referring Hospital

Circles indicate air miles from SLC
Review of all air transports, 2000-2001

1. 225 transports

2. Burn Size Estimates:
   Referring physician (%TBSA): 29.0 ± 1.8
   Burn Center Physician (on arrival): 19.7 ± 1.4
   Difference, %TBSA: 9.0 ± 0.7 (0-42% TBSA)

3. 41 patients had burns ≤ 10% TBSA, not intubated, no complicating factors.

4. 45 patients intubated for transport; 27 extubated within 24 hours (60%)

5. 21 patients had transport charges exceeding charges for care!

6. We could have done better!!

--- J Trauma, 2004;57:57
TELEMEDICINE IN ACUTE BURN CARE, 2005-2008

A demonstration project between:
- St. Peter’s Hospital, Helena, MT
- St. Vincent Healthcare, Billings, MT
- St. Alphonsus Hospital, Boise, ID
- University of Utah Burn Center, Salt Lake City, UT
<table>
<thead>
<tr>
<th>Characteristic</th>
<th>PRE-TELE</th>
<th>Air</th>
<th>Ground</th>
<th>None</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interval</td>
<td>6/03-7/05</td>
<td>28</td>
<td>31</td>
<td>9</td>
<td>30</td>
</tr>
<tr>
<td>No. patients</td>
<td>28</td>
<td>31</td>
<td>9</td>
<td>30</td>
<td>70</td>
</tr>
<tr>
<td>Gender (M/F)</td>
<td>17/11</td>
<td>24/7</td>
<td>7/2</td>
<td>22/8</td>
<td>53/17</td>
</tr>
<tr>
<td>Age (years)</td>
<td>30 (34)</td>
<td>38 (24)</td>
<td>14 (28)</td>
<td>29 (49)</td>
<td>30 (33)</td>
</tr>
<tr>
<td>Burn Size (TBSA)</td>
<td>6.5</td>
<td>9.0</td>
<td>2.5</td>
<td>3.0</td>
<td>3.0</td>
</tr>
<tr>
<td>Range TBSA</td>
<td>0-86.5</td>
<td>2.0-30.5</td>
<td>0.5-6.5</td>
<td>0-12</td>
<td>0-3.05</td>
</tr>
</tbody>
</table>

Air Transport: Pre-Tele 28/28 (100%) vs TELE 31/70 (44%; p < 0.001)
**Cause of Burn:** GASOLINE FLAME

**Date of Burn:**

**Time of Burn:**

**Age:** __________

**Sex:** ________

**Weight:** M 110 kg

**Height:** 175 cm

**Date Drawn:** __________

**Time Drawn:** __________

**Drawn By:** ________________________________

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**Cause of Burn:** Gasoline Flame

**Date of Burn:** 7 Oct 05

**Time of Burn:**

**Age:** 30

**Sex:** ________

**Weight:** 110 kg

**Height:** 175 cm

**Date Drawn:**

**Time Drawn:**

**Drawn By:** ________________________________

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**COLOR CODE**

Red – 3*

Blue – 2*

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**COLOR CODE**

Red – 3*

Blue – 2*

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**“Televideo”**

**“Live”**
N = 20; Adjusted $R^2 = 0.347$; differences -18.5 to +20% TBSA
Adjusted $R^2 = 0.968$
How can telemedicine help in Acute Burn Evaluation?

1. Accurate assessment of burn depth
2. Accurate assessment of burn extent
3. Accurate assessment of need for airway support
4. Early institution of APPROPRIATE fluid resuscitation, escharotomies
5. Justify necessary air transports
6. Obviate unnecessary air transports
7. Help local physicians provide appropriate care
Epidermal ("first degree")

Partial-thickness ("second degree")

Full-thickness ("third degree")
Superficial partial-thickness burns
DeepPartial-Thickness Burns:
* Dry Waxy-white or dull red
* Dry skin slough
* Blisters sometimes adhere
* Relatively less painful
Full-Thickness Burns

* Dry Surface
* Often leathery
* **Tight** swelling
* relatively painless
* Color is unreliable
Consultation
Burn Center Referral Criteria (relative!)

1. Patients with partial- or full-thickness burns of 10% TBSA or greater.
2. All full-thickness burns.
3. Burns of “specialty” care areas: eyes, ears, face, hands, feet, perineum, major joints.
4. Burns complicated by smoke inhalation.
5. Burns complicated by multiple trauma (in consultation with trauma center).
6. Burns from high-voltage electricity.
7. All Chemical injuries.
8. Burns in patients with significant co-morbid medical problems (e.g., diabetes).
10. Patients who will require special social or psychological support, or prolonged rehabilitation.

-- American College of Surgeons
How can telemedicine help in follow-up burn care?

1. Regular wound evaluations help keep patients local, support local physicians in care

2. Much of follow-up care is physical therapy, which is visual

3. Because patients are spared the inconvenience and expense of travel, they can be seen more regularly and get better followup

4. Psychosocial support can be given

5. The need for reconstructive surgery can be assessed routinely

6. Preop and postop followup can be performed
Cassidy Poplar, MT*

*Shown with permission!
Burn Telemedicine Visits by Year (Thru August, 2012)

These are VIDEO only!!

Telemedicine visits

- Montana
- Idaho

Pre-Grant | Grant Period | Billing


University of Utah Health Care
Televideo Burn Consultations 2003-2012
n= 785
BURN PATIENT ROBOTIC CONSULTS

NOW AVAILABLE

In partnership with University of Utah’s Burn Center

AVAILABLE 24/7

Saint Alphonsus Medical Access Center:
(877) 367-8855

TELEMEDICINE OUTREACH PROGRAM
TeleBurn Consultations Enhance Patient Care

TeleBurn is now live at Saint Alphonsus! If a burn patient presents to the ED, we are now using the latest in technology - InTouch Remote Presence - to connect patients and their physicians with the University of Utah’s Burn Center, in real-time 24/7 for an immediate physician consultation. This exciting program provides enhanced video quality and interaction between the emergency physicians and the burn experts at University of Utah.

The Access Center (877-367-8855) is available to contact University of Utah and help facilitate the TeleBurn consultation. The Access Center Nurses are able to connect simultaneously with the University of Utah physician to assist as needed with using the technology and to help facilitate transport, when necessary.

Saint Alphonsus Regional Medical Center is working with partnering hospitals in the region to extend this service in a continued effort to keep care local and improve access to specialty expertise.

Please visit the Saint Alphonsus Outreach website: http://www.saintalphonsus.org/outreach/teleburn.html for more information.

Thanks for your help in making Saint Alphonsus one of the pioneers in the field of telemedicine! For questions about TeleBurn or any other telemedicine programs at Saint Alphonsus, please contact Tiffany Whitmore, at (208) 367-7268.
Reimbursement for Burn Outpatient Services, 2007-2012

Percent payment of total charge

2007 2008 2009 2010 2011 2012

In Person
Telemedicine

0 10 20 30 40 50 60 70 80
How do we do it?

1. Our model: Access, cost savings, market share
2. Financial plan: we didn’t have one, but it has been successful
3. A convenient work environment, integrated into the inpatient service
4. Made telemedicine MAINSTREAM
5. Full-time coordinator and cheerleader
6. Present, publish or perish
7. Don’t forget Store and Forward!!

Ten critical steps for a successful telemedicine program --VanderWerf et al, Stud Health Technol Inform, 2004;104:60-8
It’s not the technology, it’s the service!

--Jonathan Linkous, CEO, American Telemedicine Association
Thank you!