

Project created on 08.09.2016 13:53.

# Report for project Senior Design Electronic book

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Task created on 08.11.2016 16:51.

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## Updated Website Blo

*No due date*

*No description*

Task tags: *No tags*

Completed by Utsav Malla on 11.11.2016 03:26.

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### **Step 1:** Updated Bio

Updated individual personal information on the website.

 Comments for step Updated Bio

*No comments*

### Activity of task Updated Website Blo

08.11.2016 16:51 *Utsav Malla* created task **Updated Website Blo**.

08.11.2016 16:53 *Utsav Malla* created Step 1 **Updated Bio**.

11.11.2016 03:26 *Shirshak Aryal* completed Step 1 **Updated Bio** (1/1 completed).

### Samples of task Updated Website Blo

*No samples*

Task created on 08.11.2016 16:56.

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## Group Meeting (November 7)

*No due date*

*No description*

Task tags: *No tags*

Completed by Shirshak Aryal on 10.11.2016 02:49.

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### **Step 3:** Validation

I validate all the comments made above.

Comments for step Validation

*No comments*

Completed by Nischal Khanal on 10.11.2016 02:36.

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### ➔ Step 2: Meeting notes

Dr. Klaesner told us to rethink through our project scope and design scopes and then come back to talk to him. Utsav will work on the design specs while Shirshak and I focus on the project scope and literature review.

Comments for step Meeting notes

*No comments*

Completed by Utsav Malla on 08.11.2016 16:58.

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### ➔ Step 1: Meeting with Dr. Klaesner (November 7, 2016)

Met with Dr. Klaesner to discuss the shortcomings in the preliminary report and how to improve our project for the remainder of the semester.

Comments for step Meeting with Dr. Klaesner (November 7, 2016)

*No comments*

### 🗄 Activity of task Group Meeting (November 7)

08.11.2016 16:56 *Utsav Malla* created task **Group Meeting**.

08.11.2016 16:58 *Utsav Malla* created Step 1 **Meeting with Dr. Klaesner (November 7, 2016)**.

08.11.2016 16:58 *Utsav Malla* completed Step 1 **Meeting with Dr. Klaesner (November 7, 2016)** (1/1 completed).

10.11.2016 02:36 *Nischal Khanal* created Step 2 **Meeting notes**.

10.11.2016 02:36 *Nischal Khanal* completed Step 2 **Meeting notes** (2/2 completed).

10.11.2016 02:49 *Shirshak Aryal* created Step 3 **Validation**.

10.11.2016 02:49 *Shirshak Aryal* completed Step 3 **Validation** (3/3 completed).

### 💧 Samples of task Group Meeting (November 7)

*No samples*

Task created on 08.11.2016 17:00.

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### 🗄 Group Meeting (November 8)

*No due date*

*No description*

Task tags: *No tags*

Completed by Shirshak Aryal on 10.11.2016 02:11.

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### ➔ **Step 2:** New tab created for Literature review upload

I did further literature review to improve our background, project scope and existing solution of our initial preliminary report, so that our progress report will be a much improved one. I also made a separate tab to upload the summary of literature reviews for articles that we reviewed.

🗨 Comments for step New tab created for Literature review upload

*No comments*

Completed by Utsav Malla on 08.11.2016 17:09.

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### ➔ **Step 1:** Group Meeting

I and Shirshak met on Tuesday Nov 8, to work on improving the design specs and project scope upon the recommendation of Dr. Klaesner. We also looked into more research papers and articles pertaining to burn victims and scar tissue contracture. We hope to incorporate these new information and the revised design specs and project scope into our progress report.

🗨 Comments for step Group Meeting

*No comments*

### 🗄 Activity of task Group Meeting (November 8)

08.11.2016 17:00 *Utsav Malla* created task **Group Meeting (November 8)**.  
 08.11.2016 17:09 *Utsav Malla* created Step 1 **Group Meeting**.  
 08.11.2016 17:09 *Utsav Malla* completed Step 1 **Group Meeting** (1/1 completed).  
 10.11.2016 02:11 *Shirshak Aryal* created Step 2 **New tab created for Literature review upload**.  
 10.11.2016 02:11 *Shirshak Aryal* completed Step 2 **New tab created for Literature review upload** (2/2 completed).

### 💧 Samples of task Group Meeting (November 8)

*No samples*

Task created on 10.11.2016 02:48.

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### 📺 Group Meeting (Google Hangouts)

*No due date*

*No description*

Task tags: *No tags*

Completed by Shirshak Aryal on 11.11.2016 03:25.

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## ➔ Step 2: Validation

I validate all the information about were true.

🗨 Comments for step Validation

*No comments*

Completed by Utsav Malla on 11.11.2016 03:24.

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## ➔ Step 1: Group Meeting

Nischal, Shirshak and I met on google hang out for one hour and discussed various aspects of our project. We came up with 8 more literature references for our project. We all agreed on reading 3 papers each and noting the relevant information down for our background and project scope. Utsav uploaded the sketches he made for our splint and included the design specs. We all agreed on Thursday evening deadline to complete reading our assigned literature and jot down any relevant information in the sci note journal under the description for that specific article.

🗨 Comments for step Group Meeting

*No comments*

### 🗨 Activity of task Group Meeting (Google Hangouts)

10.11.2016 02:48 *Utsav Malla* created task **Group Meeting (Google Hangouts)**.  
 10.11.2016 02:52 *Utsav Malla* created Step 1 **Group Meeting**.  
 10.11.2016 02:54 *Utsav Malla* edited Step 1 **Group Meeting**.  
 11.11.2016 03:24 *Shirshak Aryal* completed Step 1 **Group Meeting** (1/1 completed).  
 11.11.2016 03:25 *Shirshak Aryal* created Step 2 **Validation**.  
 11.11.2016 03:25 *Shirshak Aryal* completed Step 2 **Validation** (2/2 completed).

### 💧 Samples of task Group Meeting (Google Hangouts)

*No samples*

Task created on 10.11.2016 02:18.

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## 📄 Design Specs

*No due date*

*No description*

Task tags: *No tags*


Completed by Utsav Malla on 10.11.2016 02:56.

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## ➔ Step 1: Design Specs

Worked on some tentative design sketches for our prototype splint. These

sketches will form the foundation of our design process from here on forth. I have also included the design specs within the sketch.

 [ *new\_doc\_620161109203223035.pdf* ] File uploaded on 10.11.2016 02:33.

 Comments for step Design Specs

*Utsav Malla on 10.11.2016 at 02:34:* Utsav came up with a couple of design ideas and design specs.

 Activity of task Design Specs

10.11.2016 02:18 *Utsav Malla* created task **Design Specs**.  
 10.11.2016 02:33 *Utsav Malla* created Step 1 **Design Specs**.  
 10.11.2016 02:34 *Utsav Malla* commented on Step 1 **Design Specs**.  
 10.11.2016 02:37 *Utsav Malla* edited Step 1 **Design Specs**.  
 10.11.2016 02:37 *Utsav Malla* edited Step 1 **Design Specs**.  
 10.11.2016 02:55 *Utsav Malla* edited Step 1 **Design Specs**.  
 10.11.2016 02:56 *Utsav Malla* completed Step 1 **Design Specs** (1/1 completed).

 Samples of task Design Specs

*No samples*

Task created on 10.11.2016 02:06.

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 Literature Review

*No due date*

*No description*

Task tags: *No tags*


Completed by Shirshak Aryal on 11.11.2016 03:16.

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 **Step 5:** Paper 5- Shirshak

Esselman, Peter C., et al. "Burn rehabilitation: state of the science." American Journal of Physical Medicine & Rehabilitation 85.4 (2006): 383-413. Relevant Information: Hand burn rehabilitation 50% of hand burns in America occurs in work environment. Treatment of burns to the hands includes early excision and grafting, range of motion, splinting, pressure garments and reconstruction. Individuals affected by severe hand burns can be healed with aggressive treatment and reconstructive surgery, with these they will have better chance of regaining good functional use of their hand. Rehabilitation also has same basic principles described for treatments (above). Additionally, edema management is important for rehabilitation, due to dependent position of the hands. 1) Use of Coban wraps with other standard gauzing and dressings helps to decrease edema in hands. 2) Jobst Intermittent Compression pumps also somewhat helps to reduce edema. 3) Standard pressure garment gloves help to improve the ability of hands to perform functional tasks better compared to pressure garment work

glove. 4) Splinting also helps in rehabilitation of hand burns by maintain functional position and function. 4) Reconstructive surgery is another important technique for rehabilitation from hand deformities and contractures. 5) Joshi External Stabilizing system helps to treat and rehabilitate from claw deformity, palmar contracture, and webspace deformity caused by hypertrophic scarring, after initially removing the scarring via surgery.

 [ *Hand\_burn\_rehabilitation\_techniques.pdf* ] File uploaded on 11.11.2016 03:15.

 Comments for step Paper 5- Shirshak

*No comments*

Completed by Shirshak Aryal on 11.11.2016 02:05.

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### ➔ Step 2: Paper 2- Utsav

Edgar, Dale, and Megan Brereton. "Rehabilitation after burn injury." BMJ329.7461 (2004): 343-345. Pressure garments are the primary intervention in scar management. Applying pressure to a burn is thought to reduce scarring by hastening scar maturation and encouraging reorientation of collagen fibres into uniform, parallel patterns as opposed to the whorled pattern seen in untreated scars. Garments need to be tailored to patients' requirements and are often influenced by the type of surgery completed. Patients should generally be measured for garments at five to seven days after grafting surgery, and these should be fitted as soon as they are available. A pressure garment lasts for about three months; after that time it is helpful to re-measure patients frequently to accommodate the changing dimensions of the scar. If people have moderate to severe burns around the neck or face, an acrylic face mask must be considered. This provides conforming pressure over the face and neck. Material masks can also be made for patients to wear at night. For areas of persistent scarring that have not responded well to pressure garments, further scar management techniques must be considered. These include the use of massage, moisturising creams, and contact media.

 Comments for step Paper 2- Utsav

*No comments*

Completed by Shirshak Aryal on 11.11.2016 01:53.

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### ➔ Step 8: Paper 8- Shirshak

"Message Therapy Canada",  
<http://www.massagetherapycanada.com/technique/burn-rehabilitation-1411>  
 Relevant Information: There are three different types of burns: 1) Superficial 1st degree burn, where epidermis is partially damaged, so skins heals itself overtime with no scar tissue formation usually. 2) Superficial partial thickness burn: destruction of epidermis layer and a moderate damage to upper dermis. Skin redness, localized swelling etc are the symptoms. Takes much longer time to heal. 3) Deep Partial Thickness burn, 2nd degree: complete destruction of

epidermal layer and severe damage in dermal layer. Since dermal layer, sweat gland and sebaceous gland is damaged scar tissues are formed and healing process is very difficult and long. 4) Full thickness third degree burn: Full destruction of epidermis, dermal layers and subdermal layers. Phases of Healing: Two types of healing process, depending on skin layers that has been damaged: Epithelialization (occurs when only superficial damage takes place is epidermis) and scar tissue formation. For epithelialization, healthy epidermal cell will divide via mitosis and self heal without scar tissue formation. For scar tissue formation process, healing element is already damaged in epidermis due to deep burn. Thus dermal healing process involves the deposition of collagen, leading to the formation of a scar. The dermal healing process is longer (up to three years before the scar matures) and often results in pervasive scarring. There are three phases within scar formation: Exudative phase, granulation phase and remodeling phase. Scar Management is one of the main aspect of rehabilitation. In developed countries, team of therapists closely monitors the healing and maturation of the scar with the goal being the development of a good quality scar which is characterized as being flat, pale and pliable. Although, there is no definite science to prove the mechanism behind how massage therapy helps, they have been found to be useful in reducing scar thickness, banding, adhesions, and increasing the mobility and pliability of the scar. Different massage techniques involves: frictions, s-bowing, skin rolling and stretching, useful for scar tissue treatment and management. the application of massage techniques may distort the collagen fibres and may also break up the bonds forming adhesions between layers of tissues or between the collagen fibres. This may account for the softening of restrictive fibrous bands, increase the inter-fibre movement not only in the scar tissue but also between soft tissue layers resulting in greater tissue mobility. Since collagen is characterized as being rather in-elastic, the idea of elongating or stretching the burn scar is questionable. Massage are also found to be helpful to reduce severe itching, edema, pain and skin hyper-sensitivity. Likewise, massage also helps to stimulate movement between the muscle fibres, resulting in more fluid muscle movement, this help prevents soft tissue dysfunction of compensatory structures, further it addresses spasms, tightness and adhesion issue faced by soft tissue post burn. Only downside is that the application of massage technique, may realign fibers in symmetrical way, rather than normal random manner, which might affect the overall appearance and pliability of scar tissue formation. However, there is insufficient scientific evidence on the effects or the effectiveness of massage therapy in the treatment of burn scar tissue.

 [ Message\_Therapy\_.pdf ] File uploaded on 11.11.2016 01:56.

 Comments for step Paper 8- Shirshak

*No comments*

Completed by Shirshak Aryal on 11.11.2016 02:05.

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#### Step 4: Paper 4- Utsav

Paudel, P. Dahal BR. "Pattern of Burn patients admitted in a Burn Unit of Bir Hospital Kathmandu." Post-Graduate Medical Journal of NAMS 10.02 (2010).The

report revealed that burn commonly occurs due to domestic fire and women are found more vulnerable group for burn related injuries. The report also reveals that due to current poor socioeconomic condition and lack of proper infrastructure, recovery is slow and hospital stay is prolonged. Outcome of the treatment and morbidity differs in patients. The total body surface area more than 40% has the higher mortality rate. Prevention and management of burn are the necessity of the developing countries. The report also presents a study that revealed that 69 % of cases are in the age group of 16 - 35 years. Females were affected more in the age group of 16-25 years. The involvement of females in domestic activities may be the main factor for burn injuries in female. The age distribution revealed by the present study is similar to that found in other studies.

Comments for step Paper 4- Utsav


*No comments*

Completed by Shirshak Aryal on 10.11.2016 21:52.

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### ➔ Step 7: Paper 7- Shirshak

Liu, E. H., et al. "A 3 year prospective audit of burns patients treated at the Western Regional Hospital of Nepal." Burns 24.2 (1998): 129-133. Relevant information: Report gives trends of burn patient in rural Western part of Nepal, collected for 3 years. Patient with more than 40% of total body burns didn't survive due to lack of proper rehabilitation after initial medical intervention, as burns are usually managed by untrained and non medical professional. Most people cannot afford medical care. Annual death reported in that area was 1700. Due to poverty and ignorance public education and awareness has not been conducted yet. Cold season in Nepal has increased burns than summer. 64% of the burns were flame burns. The common form of flame burn was due to house fire (about 55%) and traditional cooking method, about 40% (cooking stoves, lamps and firewood stoves) and 5% other form. Thus, it can be said that almost all the burns were from household origin and related to cooking. There were more female patient with burns than male, and also greater mortality and greater risk ratio 2.07: 1 compared to male. 61% of the patient with domestic burns were children under 15 years. Although accepted in 1997, report was fully published by 2000 upon some modification.

 [ *Western\_Nepal\_burn\_record.pdf* ] File uploaded on 11.11.2016 01:59.

Comments for step Paper 7- Shirshak

*No comments*

Completed by Shirshak Aryal on 10.11.2016 02:27.

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### ➔ Step 9: Bibliography

*No description*

 [ *References.docx* ] File uploaded on 10.11.2016 02:26.



Comments for step Bibliography

*No comments*

Activity of task Literature Review

10.11.2016 02:06 *Shirshak Aryal* created task **Literature Review**.

10.11.2016 02:13 *Shirshak Aryal* created Step 1 **Paper 1**.

10.11.2016 02:13 *Shirshak Aryal* created Step 2 **Paper 2**.

10.11.2016 02:13 *Shirshak Aryal* created Step 3 **Paper 3**.

10.11.2016 02:14 *Shirshak Aryal* created Step 4 **Paper 4**.

10.11.2016 02:14 *Shirshak Aryal* edited Step 2 **Paper 2**.

10.11.2016 02:14 *Shirshak Aryal* created Step 5 **Paper 5**.

10.11.2016 02:14 *Shirshak Aryal* created Step 6 **Paper 6**.

10.11.2016 02:15 *Shirshak Aryal* created Step 7 **Paper 7**.

10.11.2016 02:15 *Shirshak Aryal* created Step 8 **Paper 8**.

10.11.2016 02:26 *Shirshak Aryal* created Step 9 **Bibliography**.

10.11.2016 02:27 *Shirshak Aryal* completed Step 9 **Bibliography** (1/9 completed).

10.11.2016 02:33 *Nischal Khanal* edited Step 1 **Paper 1 - Nischal**.

10.11.2016 02:33 *Nischal Khanal* edited Step 2 **Paper 2 - Nischal**.

10.11.2016 02:34 *Nischal Khanal* edited Step 2 **Paper 2**.

10.11.2016 02:34 *Nischal Khanal* edited Step 3 **Paper 3 - Nischal**.

10.11.2016 02:38 *Nischal Khanal* edited Step 6 **Paper 6 - Nischal**.

10.11.2016 02:45 *Shirshak Aryal* edited Step 1 **Paper 1 - Nischal**.

10.11.2016 02:54 *Shirshak Aryal* edited Step 2 **Paper 2- Utsav**.

10.11.2016 02:54 *Shirshak Aryal* edited Step 4 **Paper 4- Utsav**.

10.11.2016 02:55 *Shirshak Aryal* edited Step 5 **Paper 5- Shirshak**.

10.11.2016 02:55 *Shirshak Aryal* edited Step 7 **Paper 7- Shirshak**.

10.11.2016 02:55 *Shirshak Aryal* edited Step 8 **Paper 8- Shirshak**.

10.11.2016 17:53 *Shirshak Aryal* edited Step 7 **Paper 7- Shirshak**.

10.11.2016 17:53 *Shirshak Aryal* edited Step 5 **Paper 5- Shirshak**.

10.11.2016 21:51 *Shirshak Aryal* edited Step 7 **Paper 7- Shirshak**.

10.11.2016 21:51 *Shirshak Aryal* edited Step 7 **Paper 7- Shirshak**.

10.11.2016 21:52 *Shirshak Aryal* edited Step 7 **Paper 7- Shirshak**.

10.11.2016 21:52 *Shirshak Aryal* completed Step 7 **Paper 7- Shirshak** (2/9 completed).

10.11.2016 22:58 *Utsav Malla* edited Step 2 **Paper 2- Utsav**.

11.11.2016 01:18 *Utsav Malla* edited Step 4 **Paper 4- Utsav**.

11.11.2016 01:24 *Shirshak Aryal* edited Step 8 **Paper 8- Shirshak**.

11.11.2016 01:25 *Shirshak Aryal* edited Step 8 **Paper 8- Shirshak**.

11.11.2016 01:52 *Shirshak Aryal* edited Step 8 **Paper 8- Shirshak**.

11.11.2016 01:53 *Shirshak Aryal* completed Step 8 **Paper 8- Shirshak** (3/9 completed).

11.11.2016 01:56 *Shirshak Aryal* edited Step 8 **Paper 8- Shirshak** .  
11.11.2016 01:59 *Shirshak Aryal* edited Step 7 **Paper 7- Shirshak**.  
11.11.2016 02:05 *Shirshak Aryal* edited Step 5 **Paper 5- Shirshak**.  
11.11.2016 02:05 *Shirshak Aryal* completed Step 4 **Paper 4- Utsav** (4/9 completed).  
11.11.2016 02:05 *Shirshak Aryal* completed Step 2 **Paper 2- Utsav** (5/9 completed).  
11.11.2016 02:05 *Shirshak Aryal* completed Step 2 **Paper 2- Utsav** (5/9 completed).  
11.11.2016 02:05 *Shirshak Aryal* completed Step 2 **Paper 2- Utsav** (5/9 completed).  
11.11.2016 02:05 *Shirshak Aryal* completed Step 2 **Paper 2- Utsav** (5/9 completed).  
11.11.2016 02:05 *Shirshak Aryal* completed Step 2 **Paper 2- Utsav** (5/9 completed).  
11.11.2016 03:14 *Shirshak Aryal* edited Step 5 **Paper 5- Shirshak**.  
11.11.2016 03:15 *Shirshak Aryal* edited Step 5 **Paper 5- Shirshak**.  
11.11.2016 03:15 *Shirshak Aryal* edited Step 5 **Paper 5- Shirshak**.  
11.11.2016 03:16 *Shirshak Aryal* completed Step 5 **Paper 5- Shirshak** (6/9 completed).

🔹 Samples of task Literature Review

*No samples*