Introduction: Surgical site infection (SSI) is an infection that develops within 30 days after surgery. SSIs remain a major cause of morbidity and death among the operated patients and continue to represent about a fifth of all healthcare-associated infections. The incidence of SSI range from 5% to 34% across literature1. In developing countries, where resources are limited, even basic life-saving operations, such as appendectomies and caesarean sections, are associated with high infection rates and mortality2. Patients who develop SSI require significantly more medical care. If SSI occurs, a patient is 60 percent more likely to spend time in the ICU after surgery than is an uninfected surgical patient and increases the length of hospital stay by a median of two weeks3. In current scenario, SSI are detected only after appearance of clinical signs and symptoms, at this stage the infection is at its advanced stage and needs significant medical care to control it.

Objectives: A non-contact device to detect SSI in its earliest sub-clinical stage, leading to early initiation of necessary treatment.

Rational: The five phases of infectious disease.

- **Entry of the pathogen into the host (patient), (clinically undetected)**
- **The host begins to experience general signs and symptoms of illness. (early stage clinically undetected)**
- **The signs and symptoms of illness begin to decline. (clinically detected)**
- **The signs and symptoms of disease are most obvious and severe. (clinically detected)**

Inflammation is characterized by five cardinal signs: rubor (redness), calor (increased heat), tumor (swelling), dolor (pain), and functio laesa (loss of function). Early inflammatory changes (clinically undetectable) start in prodromal period. Early diagnosis of SSI in prodromal period, could result in early treatment and rapid recovery. But current modalities are unable to detect SSI in early subclinical stage.

Method: Early inflammatory changes like “calor” (increased heat) could be useful in identifying SSIs in subclinical stage. Thermal imaging of surgical site can detect rise in temperature (related to inflammation) even before appearance of clinical signs and symptoms. A device using thermal imaging and image processing can be used to detect SSI in its initial stages. This novel, non invasive, non contact technique can be used to take images of the surgical site daily during routine care of the site. During a pilot study, 100 patients were screened for 30 days after surgery. This technique was able to detect SSIs at early stage, 24 to 30 hours prior to onset of clinical signs and symptom. Marked changes could be appreciated on thermal images of the surgical site which later manifested in clinical signs and symptom of infection. Further, study is required to determine sensitivity and specificity of the device.

Conclusions: The device will facilitate early detection of SSIs and reduce morbidity, hospital stay and cost for patients.