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**Agents of infections with
skin manifestations**

Infections with skin symptoms

- **primary skin infections**
- **secondary infections of already diseased skin**
- **skin symptoms of systemic infections**

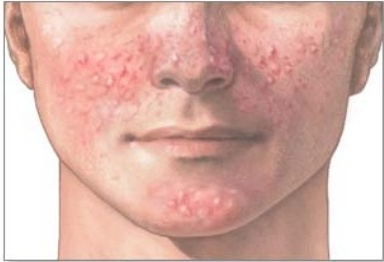
Etiology:

- **bacterial**
- **viral**
- **fungal**
- **parasitic**

Bacterial skin infections

Primary acute bacterial skin infections – I

Adult facial acne



***Propionibacterium acnes* – acne vulgaris**

***Staphylococcus aureus* - folliculitis**

ADAM.



Primary acute bacterial skin infections – II

erysipelas – *Streptococcus pyogenes* (GAS)

- local redness, heat, swelling, and a highly characteristic raised, indurated border, **no localized purulence**

- the **legs and face** are the most frequently affected sites

- on the face is a **butterfly distribution** involving the cheeks and the bridge of the nose



Primary acute bacterial skin infections – III

hordeolum (stye)

– *Staph. aureus*

Impetigo ! →

- *Staph. aureus*,

- *Str. pyogenes*

lymphangoitis

– *Strept. pyogenes*



Stye



Primary acute bacterial skin infections – IV

Panaritium (whitlow)

Staphylococcus aureus

paronychium

Staphylococcus aureus



Primary acute bacterial skin infections – V

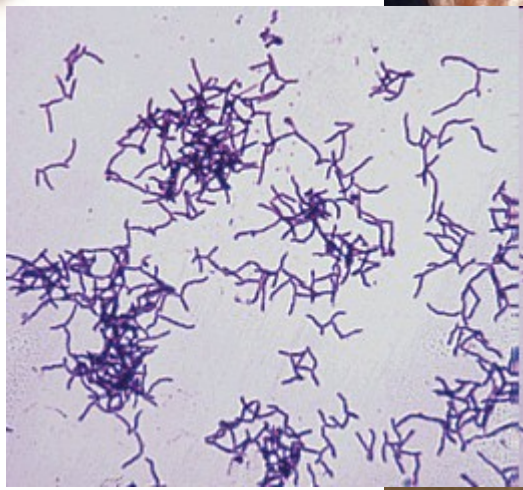
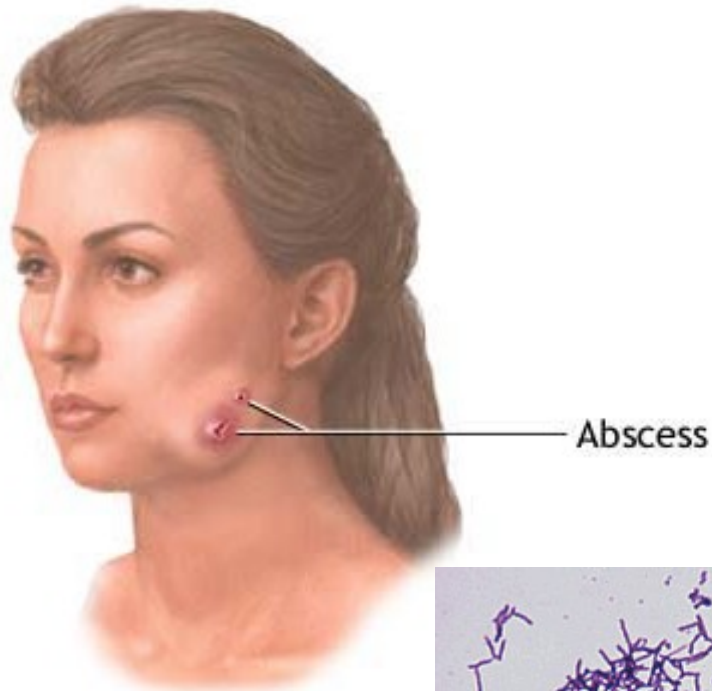
erythema migrans – *Borrelia burgdorferi*

- ticks (*Ixodes ricinus*)
- serology, PCR
- doxycycline in adults



Primary chronic bacterial skin infections

- actinomycosis ! - *Actinomyces israelii*
- **chronic subcutaneous abscesses** -
A. israelii, Nocardia asteroides, Rhodococcus equi
- **skin granulomas** -
Mycobacterium marinum, M. haemophilum, M. chelonae
- **leprosy** - *Mycobacterium leprae*
- *Mycobacterium tuberculosis* – lupus vulgaris



actinomycosis – *Actinomyces israelii*

Secondary infections of skin lesions

- **decubitus (bedsore), trophic ulcer** – neighbouring and endogenous flora (staphylococci, streptococci, enterococci, enteric bacteria, pseudomonads, anaerobes, yeasts)
- **infected intertrigo (raw)** – *S. aureus*, *P. acnes*
- **sec. infected dermatomycoses** – *S. pyogenes*
- *infected wounds* – *will be discussed individually*

Skin symptoms of systemic bacterial infections

roseola (rash in typhoid fever) – *Salmonella Typhi*

disseminated gonorrhoea – *Neisseria gonorrhoeae*

infective endocarditis – splinter haemorrhages

scarlatina (scarlet fever) – *Streptococcus pyogenes*

SSSS (staphylococcal scalded skin syndrome) –
Staphylococcus aureus

syphilis – *Treponema pallidum*

Infective endocarditis – splinter haemorrhages





Rash - meningococemia – *Neisseria meningitidis*



scarlatina (scarlet fever) – *Streptococcus pyogenes*

Fungal infections



cutaneous mycoses

Etiology of skin fungal infections

Etiology differs in...

- **superficial mycoses**, like **pityriasis versicolor** – *Malassezia furfur* (syn. *Pityrosporum ovale*)
- **mucocutaneous mycoses** – *Candida albicans* and other species of candidae
- **cutaneous mycoses** – typical dermatophytes
- **subcutaneous mycoses**
- **opportunistic skin mycoses** in immunodeficient

Etiology of cutaneous mycoses

Tinea pedis – *Trichophyton rubrum*, *Trich. mentagrophytes* var. *interdigitale*, *Epidermophyton floccosum*

Onychomycosis – *T. rubrum*, *E. floccosum*

Tinea corporis – *T. rubrum*, *Microsporum canis*, *M. gypseum*, *T. mentagrophytes* var. *mentagrophytes*, *E. floccosum*

Tinea capitis – *M. gypseum*, *M. canis*, *M. audouinii*, *T. mentagrophytes* var. *mentagrophytes*

Etiology of subcutaneous mycoses

pheohyphomycosis (lesions with pigmented hyphae) –
genera *Alternaria*, *Aureobasidium*, *Cladosporium*,
Culvularia, *Exophiala*, *Phaeoannelomyces*, *Phoma*,
Wangiella & others

chromoblastomycosis (wartlike nodules with sclerotic bodies)
– *Cladophialophora*, *Fonsecaea*, *Phialophora*

mycetoma eumycoticum (swollen lesion with draining tracts
containing small grains) – *Acremonium*, *Exophiala*,
Madurella, *Pseudoallescheria* (= *Scedosporium*)

sporotrichosis (dimorphic fungus) – *Sporothrix schenckii*

Viral infections

Skin symptoms in viral diseases – I

Macular (spotted) exanthem:

morbilli – morbilli virus, *Morbillivirus* genus

rubella – rubella virus, *Rubivirus* genus

erythema infectiosum (the fifth disease) –
parvovirus B19, *Erythrovirus* genus

exanthema subitum (roseola infantum, the sixth
disease) – HHV 6, *Roseolovirus* genus

Umbiliform papulae:

molluscum contagiosum – molluscum
contagiosum virus, *Molluscipoxvirus* genus

Typical molluscum bumps. Note the pearly appearance and the dimple in the center of the bumps.



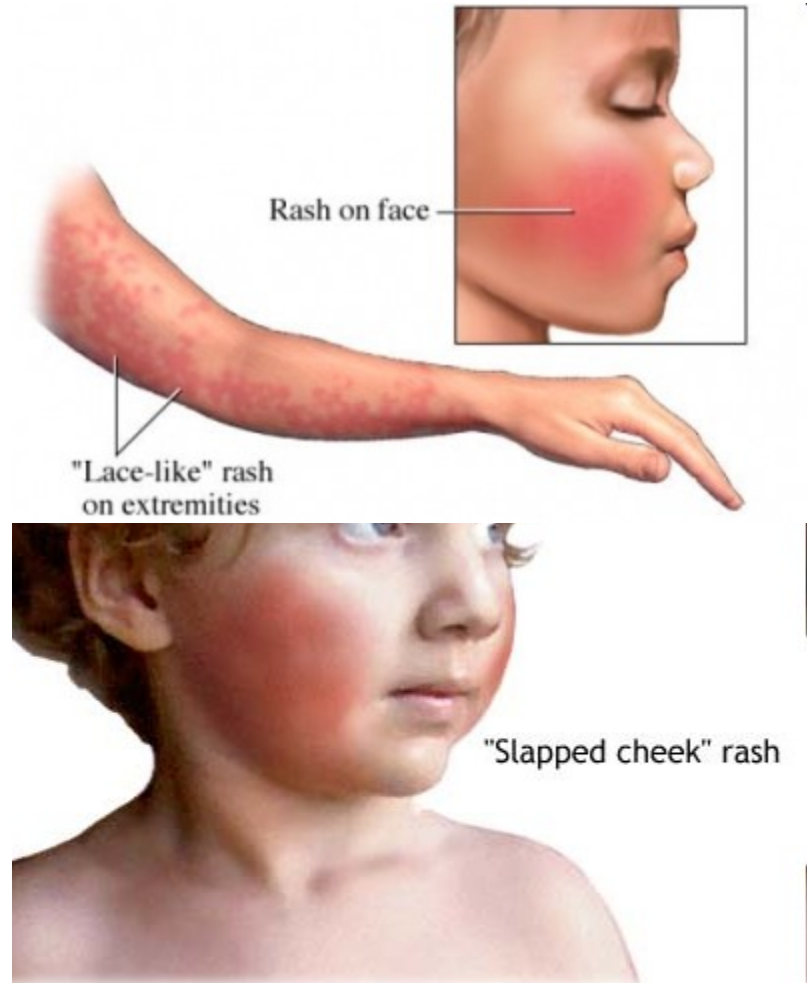
cdc.gov

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Medscape® <http://www.medscape.com>

Sixth Disease/ Exanthem subitum, Roseola infantum, "Sudden Rash", rose rash of infants, 3-day fever



ADAM.

Fifth Disease/Erythema infectiosum - Erythrovirus (Parvovirus) B19

Fifth Disease/Erythema infectiosum



<http://img405.imageshack.us>

Skin symptoms in viral diseases – II

Vesicles:

herpes simplex (cold sore) – HSV 1, *Simplexvirus* genus

herpes genitalis – HSV 2, *Simplexvirus* genus

varicella (chicken pox) – varicella-zoster virus, VZV, *Varicellovirus* genus

herpes zoster (shingles) – varicella-zoster virus, VZV, *Varicellovirus* genus

hand, foot and mouth disease – coxsackievirus A16, *Enterovirus* genus

varicella (chicken pox) – varicella-zoster virus, VZV, *Varicellovirus* genus



herpes simplex (cold sore) – HSV 1, *Simplexvirus* genus

Skin symptoms in viral diseases – III

Petechiae:

Hemorrhagic fevers –

Ebola fever, Ebola virus, *Ebolavirus* genus

Marburg disease, Marburg virus, *Marburgvirus* genus

Lassa fever, Lassa virus, *Arenavirus* genus

Generalized congenital cytomegalic disease –

cytomegalovirus, CMV, *Cytomegalovirus* genus



Ebola is still limited to parts of Africa

A hemorrhagic rash appears over entire body



Modes of Infection



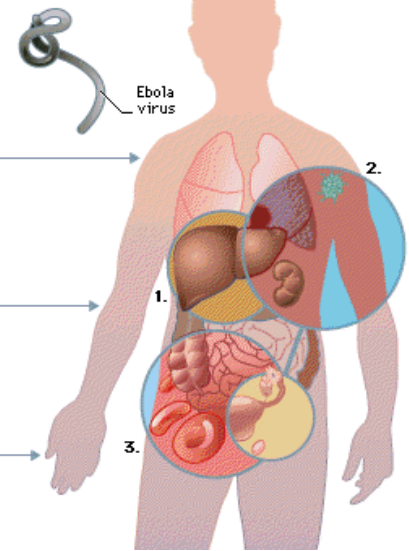
Unsterilized needles



Hospital contagion



Person-to-person contact



Ebola Patient (Intensive Care)

Parasitic infections

Skin symptoms in parasitoses – I

Domestic parasitoses:

scabies – itch mite, *Sarcoptes scabiei*

pediculosis capitis – head louse, *Pediculus capitis*

pediculosis corporis – body louse, *Pediculus humanus* (syn. *Pediculus corporis*)

pediculosis pubis (phthiriasis) – pubic (crab) louse, *Phthirus pubis*

Skin symptoms in parasitoses – II

Infestation by native ectoparasites:

cimicosis, urticaria cimicosa – bites by bedbug
Cimex lectularius

pulicosis – bites by human flea *Pulex irritans*,
dog flea *Ctenocephalides canis*,
cat flea *Ctenocephalides felis*,
chicken flea *Ceratophyllus gallinae*

Skin symptoms in parasitoses – III

Tropical parasitoses:

ulcus humidum (humid ulcer) – *Leishmania major*

ulcus siccum (dry ulcer) – *Leishmania tropica*

espundia – *Leishmania braziliensis*

tungosis – chigoe flea *Tunga penetrans*

dermatitis cercariosa – cercariae of *Schistosoma*,
Bilharziella and *Trichobilharzia* genera

dracunculosis – *Dracunculus medinensis*

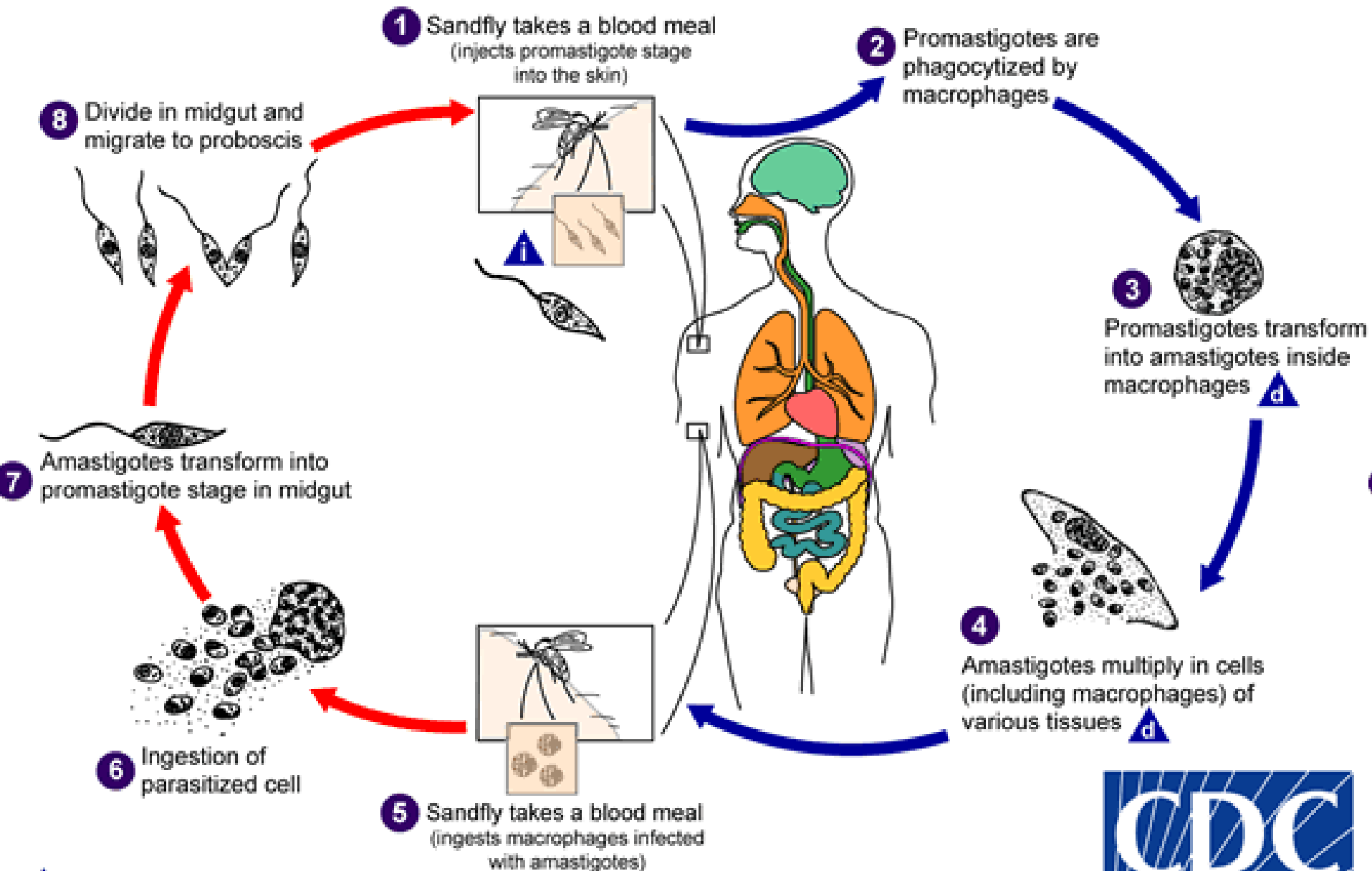
filariosis – filariae *Loa loa* and *Onchocerca volvulus*



Leishmaniasis

Sandfly Stages

Human Stages



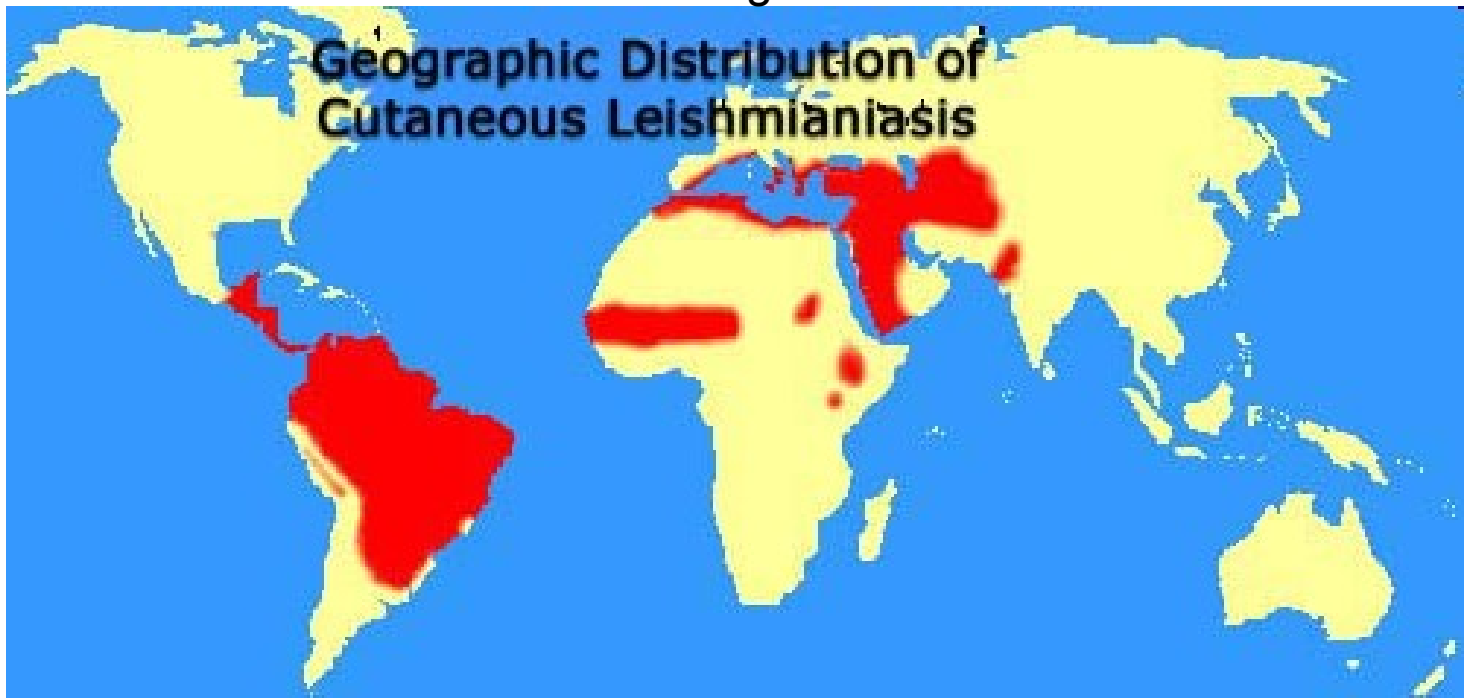
i = Infective Stage

d = Diagnostic Stage





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Edvard Munch (1863-1944): Death in a Room

