OCCUPATIONAL SKIN DISEASES

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EPIDEMIOLOGY

- ACCOUNTS FOR >30% OF OCCUPATIONAL ILLNESSES
- ACCOUNTS FOR 3% OF SICK DAYS FOR OCCUPATIONAL ILLNESS
- 4 MILLION WORKING DAYS ARE LOST DUE TO OCCUPATIONAL SKIN DISEASE
- ASSOCIATED COST TO INDUSTRY OF £100 MILLION PER YEAR

INTRODUCTION

- A SKIN DISEASE THAT IS CAUSED BY PHYSICAL, BIOLOGICAL OR CHEMICAL FACTOR IN WORK
- ALSO A WORSENING OF PRE-EXISTING SKIN DISEASE CAN BE TERMED AS OCCUPATIONAL SKIN DISEASE (PSORIASIS , ACNE)

WORK PLACE AGENTS THAT INDUCED SKIN DISORDER

- **CHEMICALS**

ACIDS
ALKALIS
SOLVENTS
OILS
DETERGENTS
RESINS
PLASTICS
METALS
PETROLEUM PRODUCT
PLANT & WOOD

- **PHYSICALS**

TEMPERATURE
IONIZING RADIATION
NON IONIZING RADIATION

- **BIOLOGIC**

VIRUSES (ORF-WART-HERPES)
BACTERIA(ANTHRAX-ERISOPELOID)
FUNGI(CANDIDA-DERMATOPHYTE)
PARASITES(SCABIES-(SCHISTOSOMIASIS)

- **MECHANICALS**

PRESSURE
FRICTION
VIBRATION

IMPORTANT CAUSAL AGENTS OF OCCUPATIONAL SKIN DISEASE BY SELECTED INDUSTRY CLASSIFICATIONS

- **ELECTRONIC:** SOLVENTS ,RESINS ,ACIDS ,FIBERGLASS ,METALS
- **MACHINERY:** CUTTING OILS ,SOLVENTS , RESINS , FIBERGLASS
- **RUBBER & PLASTIC PRODUCTS :**FIBERGLASS ,RESINS , SOLVENTS
- **STONE ,CLAY ,GLASS:** CEMENT
- **FOOD PRODUCT:** FRUITS ,VEGETABLES ,MEATS
- **AGRICULTURE:** PLANT & ANIMAL PRODUCTS

DIAGNOSIS

History

Description of the job:
-Duties performed
-Substance encountered
-Protective an cleaning equipment used
-Temporal relationship between dermatitis and work(during vacation and at work)
-Whether other co-workers are affected

HISTORY

- **PAST MEDICAL HISTORY**

  HISTORY OF ATOPY

  HISTORY OF DERMATITIS IN PREVIOUS JOB

- **RECREATIONAL HISTORY**

  EXPOSURE TO IRRITANTS DURING LESISURETIME ACTIVITY

- **SECOND JOB**

CLINICAL EAMINATION

- **GENERAL EXAMINATION**
- **SKIN EXAMINATION**

  PATTERN

  MORPHOLOGY

  SYMMETRY
- **ICD** IS USUALLY LOCATED TO THE AREA IN CONTACT

  WITH THE CHEMICALS
- **ACD** MAY BE MORE WIDESPREAD

WORKPLACE ASSESSMENT

- IDENTIFICATION OF FURTHER SUBSTANCE
- EVALUATION OF DEGREE OF EXPOSURE
- WHICH SUBSTANCE COME INTO DIRECT CONTACT WHIT SKIN
- DEGREE OF FREQUENCY OF SUCH CONTACT AND SITE OF CONTACT
- LOOK IN DETAIL AT THE WORKPLACE PROCESS
- CHECK ENVIRONMENTAL FACTORS:

  (HUMIDITY/VENTILATION/GENERAL HYGIENE)

SPECIAL INVESTIGATION

- **BIOPSY**
- **FUNGAL SCRAPING**
- **PATCH TEST**

CLASSIFICATION OF SKIN DISEASE

- **OCCUPATIONAL DERMATITIS**
- **OCCUPATIONAL PHOTOSENSITIVITY REACTIONS**
- **OCCUPATIONAL PHOTOTOXICITY REACTION**
- **OCCUPATIONAL SKIN CANCERS**
- **OCCUPATIONAL CONTACT URTICARIA**
- **OCCUPATIONAL ACNE**
- **OCCUPATIONAL SKIN INFECTIONS**
- **OCCUPATIONAL PIGMENTARY DISORDERS**
- **MISCELLANEOUS**

CONTACT DERMATITIS

- **OCCUPATIONAL DERMATITIS IS AN INFLAMMATION OF THE SKIN CAUSING ITCHING, PAIN, REDNESS, SWELLING AND SMALL BLISTERS.**

- **CONTACT DERMATITIS IS AN ECZEMATOUS ERUPTION CAUSED BY EXTERNAL AGENTS, WHICH CAN BE BROADLY DIVIDED INTO:**

  - **IRRITANT SUBSTANCES THAT HAVE A DIRECT TOXIC EFFECT ON THE SKIN (IRRITANT CONTACT DERMATITIS, ICD)**

  - **ALLERGIC CHEMICALS WHERE IMMUNE DELAYED HYPERSENSITIVITY REACTIONS OCCUR (ALLERGIC CONTACT DERMATITIS, ACD).**

Dermatitis

OCCUPATIONS WITH THE HIGHEST RATE OF DERMATITIS

Occupation	Rate of dermatitis (cases per 100,000 workers per year) in 2015– 2016
Florists	109
Hairdressers and barbers	81
Beauticians	73
Cooks	61
Metal working operatives	54

PROGNOSIS OF OCCUPATIONAL DERMATITIS AFTER TREATMENT

- **25% COMPLETE RECOVERY**
- **25% REFRACTORY**
- **50% REMITTING / RELAPSING**

Influencing factors

- Constitutional factors
  - Atopic skin diathesis
  - History of:
  - Flexural eczema
  - Hand dermatitis
- Wet work
  - wet hands >2h/day
  - Occlusion by gloves
  - Frequent hand washing

Age, sex

High /low temperature

Chemical irritation

Mechanical irritation

HOW EXPOSURE CAN OCCUR

Direct handling

Contaminated surfaces

Splashing

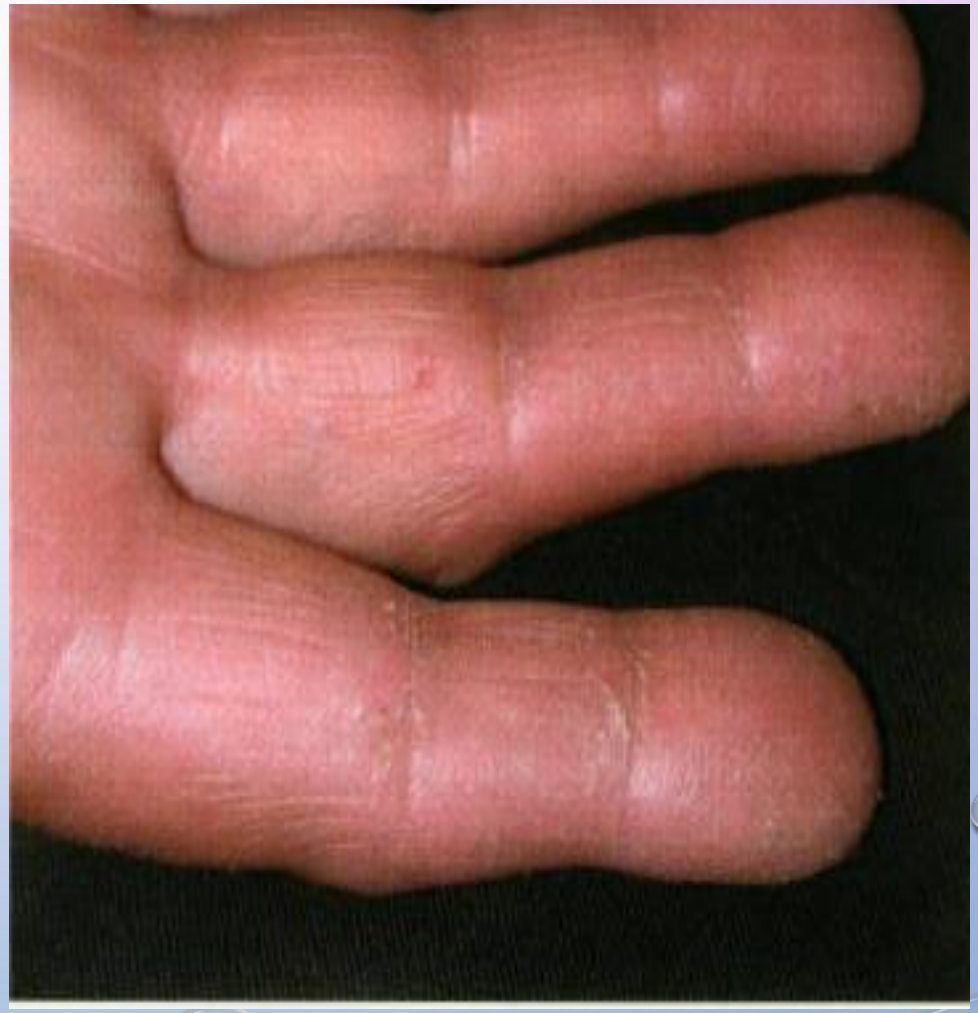
Immersion

Deposition

CASE 1

Erythema , dryness and itching on the right hand of a printer man

What is your diagnosis ?



CAUSATIVEAGENTS: IRRITANT O.C.D

- **CHEMICAL**
  - ALCOHOLS
  - ACID
  - ALKALIN
  - CUTTING OILS
  - DEGREASERS
  - DISINFECTANTS
  - PETROLEUM PRODUCTS
  - SOAPS AND CLEANERS
  - WET WORK
- **PHYSICAL (<1%)**
  - FRICTION
  - LOW HUMIDITY
  - HOT AND DRY AIR

HIGH RISK OCCUPATION FOR ICD

- **CLEANER**
- **HOUSEKEEPING**
- **FOOD SERVICE**
- **MEDICAL/DENTAL**
- **ENGINEER**
- **HAIRDRESSER**
- **MECHANIC**
- **BUTCHER**
- **AGRICULTURE/GARDENING**
- **MACHINIST**

CLINICAL FEATURES OF CONTACT DERMATITIS

- **LOCATION**
  - SKIN DISEASE **STARTS** ON THE AREA OF CONTACT.
    - DORSAL ASPECTS OF HANDS AND FINGER
    - VOLAR ASPECTS OF ARMS
    - INTERDIGITAL WEBS
    - MEDIAL ASPECT OF THIGHS
    - DORSAL ASPECTS OF FEET
  - MAY IN FACE (FOREHEAD, EYELIDS, EARS, NECK) AND ARMS DUE TO AIRBORNE IRRITANT DUSTS AND VOLATILE IRRITANT CHEMICALS

ACUTE IRRITANT CONTACT DERMATITIS

- COMMONLY SEEN IN OCCUPATIONAL ACCIDENTS
- IRRITANT REACTION REACHES ITS PEAK QUICKLY, WITHIN MINUTES TO HOURS AFTER EXPOSURE
- SYMPTOMS INCLUDE STINGING, BURNING, AND SORENESS
- PHYSICAL SIGNS INCLUDE ERYTHEMA, EDEMA, BULLAE, AND POSSIBLY NECROSIS
- LESIONS RESTRICTED TO THE AREA WHERE THE IRRITANT OR TOXICANT DAMAGED THE TISSUE
- SHARPLY DEMARCATED BORDERS AND ASYMMETRY POINTING TO AN EXOGENOUS CAUSE
- MOST FREQUENT IRRITANTS ARE ACIDS AND ALKALINE SOLUTIONS


DOIA
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Department of Dermatology

CHRONIC (CUMULATIVE) ICD

- REPETITIVE EXPOSURE TO WEAKER IRRITANTS

  -WET : DETERGENTS, ORGANIC SOLVENTS, SOAPS, WEAK ACIDS, AND ALKALIS

  -DRY : LOW HUMIDITY AIR, HEAT ,DUSTS , AND POWDERS

- DISEASE OF THE *STRATUM CORNEUM*

CLINICAL FEATURES OF CONTACT DERMATITIS

- **SIGN AND SYMPTOMS**
  - **CUMULATIVE (EXPOSURE TO WEAK IRRITANTS)**
    - **DELAYED PAIN AND BURNING**
    - **VESICLES AND LITTLE PRURITUS**
    - **LICHENIFICATIONS, FISSURES**

CASE 2

A builder man presented with erythema , scaling and pruritus on his hands

What is your diagnosis ?

CAUSATIVE AGENTS: ALLERGIC O.C.D

- COBALT /CHROMIUM/NICKEL
- FORMALDEHYDE
- RUBBER-PROCESSING CHEMICALS
- COSMETICS, FRAGRANCES
- EPOXY RESINS
- PLANTS/WOOD
- PRESERVATIVES
- ACRYLICS
- BIOCIDES

HIGH RISK OCCUPATION FOR ACD

- **TEXTILE**
- **PAINTING**
- **PRINTING**
- **AGRICULTURE**
- **HAIRDRESSER**
- **METAL WORKER**
- **RUBBER MANUFACTURE**
- **LEATHER TANNING**
- **PLASTIC MANUFACTURE**

CLINICAL FEATURES (ACUTE FORM)

- RASH APPEARS IN AREAS EXPOSED TO THE SENSITIZING AGENT, USUALLY ASYMMETRIC OR UNILAT.
- SENSITIZING AGENT ON THE HANDS OR CLOTHES IS OFTEN TRANSFERRED TO OTHER BODY PARTS.
- THE RASH IS CHARACTERIZED BY ERYTHEMA, VESICLES AND SEVER EDEMA.
- PRURITUS IS THE OVERRIDING SYMP.

CLINICAL FEATURES (CHRONIC FORM)

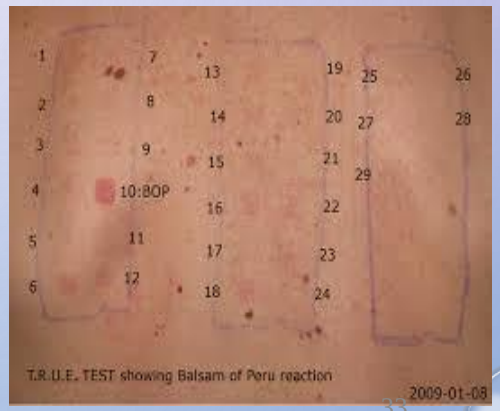
- **THICKENED , FISSURED, LICHENIFIED SKIN WITH SCALING**
- **THE MOST COMMON SITES:**
  - **DORSAL ASPECT OF HANDS**
  - **EYELIDS**
  - **PERORBITAL**

Figure 1.3 *Allergic:* This is a classic example of allergic contact dermatitis, showing typical clinical lesions, with vesicles, blisters and exudation.

Figure 4.99 The rubber insole of the black rubber boots worn by a construction worker was responsible for this plantar dermatitis. The allergens proved to be the antioxidants added to the insole: *N*-isopropyl-*N*'-phenyl-*p*-phenylene-diamine (IPPD) and cyclohexyl-phenyl-paraphenylenediamine (CPPD).

Figure 4.100 This chronic dermatitis on the dorsum of the foot was caused by chromate contained in the leather of Spanish-manufactured footware.

Patch testing



- PATCH TESTING IS A TIME CONSUMING PROCESS THAT REQUIRES AT LEAST THREE VISITS
- WORKERS SHOULD AVOID SHOWERING, EXERCISING, AND EXTREMES OF HEAT AND HUMIDITY

Case 3

A worker with itchy papules on his forearm

What is your diagnosis?

DX : FIBER GLASS DERMATITIS (KIND OF CD)

- MECHANISM OF SKIN INJURY IS VIA DIRECT PENETRATION
- PRURITUS AND TINGLING ARE THE USUAL INITIAL SYMPTOMS
- SUBSEQUENTLY ERYTHEMATOUS PAPULES DEVELOP (OFTEN WITH FOLLICULAR ACCENTUATION) ON EXPOSED AREAS WHEN THERE IS AIRBORNE EXPOSURE OR ON THE FOREARMS WHEN THERE IS CONTAMINATION OF A WORK SURFACE
- PARONYCHIA IS COMMON AND AIRBORNE EXPOSURE MAY ALSO CAUSE BURNING EYES, SORE THROAT AND COUGH

OCCUPATIONAL SKIN CANCERS

- **THE SECOND FORM OF OCCUPATIONAL SKIN DISEASES**
- **ABOUT 17% OF ALL CASES OF OCCUPATIONAL SKIN DISEASES**

OCCUPATIONAL SKIN CANCER

- **ULTRAVIOLET LIGHT**
- **POLY CYCLIC AROMATIC HYDROCARBONS**
- **ARSENIC**
- **IONIZING RADIATION**
- **TRAUMA**

Table 1. Occupations at risk for occupational skin cancer

Causative agent	Occupation
Arsenic	Manufacture of insecticide or herbicide
	Agricultural exposure to pesticide
	Smelting of copper, lead, zinc
	Mining of arsenic
Polycyclic hydrocarbons	Distillation of coal tar
	Manufacture of coal gas
	Working with shale oil, creosote, asphalt and chimney soot
Ultraviolet irradiation	Outdoor work, e.g. agriculture, driving, fishing and construction
	Welding
	Laser exposure
	Certain printing processes
Ionizing radiation	Nuclear plant operations
	Diagnostic X-ray work
	Uranium mining
Burn	Welding

264 Tar keratoses.

265 Tar keratoses.

259 Pigmented tar keratoses.

260 Squamous cell carcinoma on the back of the hand of a soldier who had observed nuclear weapons tests.

261 Multiple BCC following arsenic ingestion.

268 Pigmented BCC.

269 Ulcerating nodular cystic BCC.

270 Morphoeic BCC on the nose.

271 Superficial BCC on the shoulder of a professional yachtsman.

OCCUPATIONAL ACNE

ENVIRONMENTAL ACNEA

- **PREEXISTING ACNE VULGARIS MAY BE AGGRAVATED BY VARIOUS OCCUPATIONAL STRESS**

1-TROPICAL ACNE: ACNE PRONE INDIVIDUALS EMPLOYED IN TROPICAL CLIMATES

2-ACNE MECHANICA: TIGHT FITTING WORK CLOTHING ,PRESSURE FROM SEAT BELT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OIL ACNE

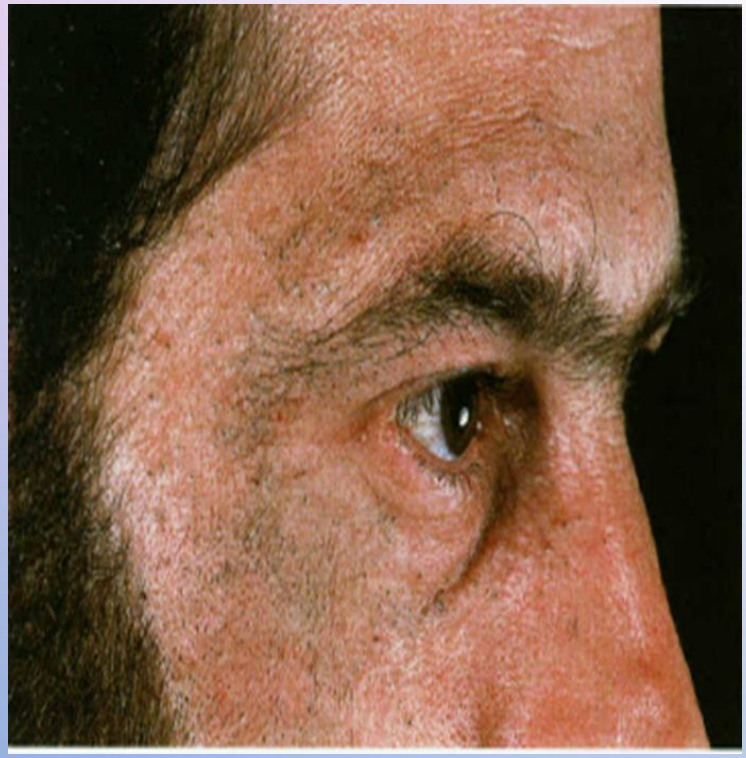
OCCUPATION AT RISK

- MACHINIST
- OIL FIELD WORKER
- OIL REFINER
- AUTO, TRUCK, AIR CRAFT, BOAT MECHANICS
- RUBBER WORKER
- ROOFERS
- ROAD MAINTENANCE WORKERS

239 Oil folliculitis with follicular plugging and inflammatory papules (courtesy of the National Institute for Occupational Safety and Health, Cincinnati, OH).

CLORACNE

- **OCCUPATION AT RISK**
  - WORKERS IN PRODUCTION OF PESTICIDES, HERBICIDES
  - ELECTRICAL WORKERS EXPOSED TO PCB (TRANSFORMER OIL)



AGE
DIFFERENTIAL FEATURES OF ACNE

• OIL ACNE	ANY AGE
• ACNE VULGARIS	PEAK INCIDENCE, AGES 11-20
• CHLORACNE	ANY AGE

DISTRIBUTION
DIFFERENTIAL FEATURES OF ACNE

• OIL ACNE	EXPOSED AREA
• ACNE VULGARIS	FACE ,NECK ,CHEST
• CHLORACNE	FACE, ESPECIALLY MALAR CRESCENT & AURICULAR CREASES, AXILLAE, GROIN, NOSE SPARED

ASSOCIATED CONDITIONS DIFFERENTIAL FEATURES OF ACNE

• OIL ACNE	MELANOSIS/PHOTOSENSITIVITY
• ACNE VULGARIS	NONE
• CHLORACNE	XEROSIS, CONJUNCTIVITIS, ACTINIC ELASTOSIS, PHERIPHERAL NEURITIS, LIVER ABNORMALITIES

PIGMENT DISORDERS

TOXIC VITILIGO

- DEPIGMENTATION CAN BE CAUSED BY INHIBITING OF MELANIN SYNTHESIS, KILLING THE MELANOCYTES.
- PHENOLIC OR CATHECOLIC DERIVATIVES:

  RUBBER MFG, PHOTOGRAPHIC DEVELOPING AGENTS ,LUBRICATING OILS ,PLASTIC MFG ,DISINFECTANTS

(a)

(b)

Figure 4.101 (**a**) The cause of the loss of pigment on the dorsum of the foot was an adhesive that contained *p-tert*-butylphenol–formaldehyde resin. The depigmentation was not post-inflammatory. This type of depigmentation does not require antecedent dermatitis, and is seen in industrial exposures to this same class of compounds (Rietschel and Fowler, 1995, p.770). (**b**) An example of post-inflammatory depigmentation.

DISCOLORATIONS AND STAINS

- **MECHANISM:** DEPOSITION , STIMULATION OF MELANIN SYNTHESIS

  - CHRONIC INTOXICATION FROM HEAVY METALS:

  AG ,HG ,AS

  - NITROSYLATED COMPOUNDS:

  TNT ,DINITRO PHENOL ,…

SEQUELAE OF CONTACT DERMATITIS

Figure 1.14 This 31-year-old woman with post-inflammatory hyperpigmentation had an antecedent nickel dermatitis due to a jeans button.

Figure 1.15
Hyperpigmentation may be the sequela of many forms of dermatitis; in this example the initial eruption was stasis dermatitis.

Figure 1.16 This is a 76-year-old man with post-inflammatory hyperpigmentation following mechanical dermatitis from his belt.

CONTACT URTICARIA

- ***DEFINITION:*** **CHARACTERIZED BY TRANSIENT SKIN OR MUCOSAL SWELLINGS DUE TO PLASMA LEAKAGE.**
  - **SUPERFICIAL DERMAL SWELLINGS *ARE WHEALS***
  - **DEEP SWELLINGS OF THE SKIN OR MUCOSA *ARE ANGIOEDEMA.***
- ***WHEALS*** **ARE CHARACTERISTICALLY PRURITIC AND PINK OR PALE IN THE CENTER,**
- ***ANGIOEDEMA*** **IS OFTEN PAINFUL, LESS WELL DEFINED AND SHOWS NO COLOR CHANGE.**

CONTACT URTICARIA

- LATEX ALLERGY
- FORMALDEHYDE
- FOOD INDUSTRY
  - PLANTS
  - VEGETABLES
  - ANIMAL PRODUCTS
- PHARMACEUTICAL INDUSTRY
  - STREPTOMYCIN

CONTACT URTICARIA

- **ANIMAL HUSBANDRY, FARMERS, VETS**
  - **COW DANDER**
- **COOKS, FOOD PREPARATION WORKERS, KITCHEN WORKERS**
  - **FOOD, ANIMAL PRODUCTS**
- **KITCHEN WORKERS, BAKERS, MILLERS**
  - **FLOUR, GRAINS**
- **HEALTH CARE, ANIMAL HUSBANDRY, VETS, LABORATORY WORKERS**
  - **NATURAL RUBBER LATEX**

- **LATEX ALLERGY: IS OF SPECIAL CONCERN BECAUSE OF THE RISK OF ANAPHYLAXIS, WHICH IS A LIFE THREATENING ALLERGIC REACTION.**
- **OCCUR IN:**

1-DIRECT CONTACT WITH LATEX

2-PEOPLE WHO EAT FOOD PREPARED BY PERSONNEL WEARING LATEX GLOVES

- **SYNTHETIC GLOVES THAT DO NOT CONTAIN LATEX INCLUDE THOSE MADE OF VINYL, NITRIL**
- **VINYL GLOVES : SUITABLE FOR FOOD HANDLERS DO NOT OFFER APPROPRIATE PROTECTION AGAINST INFECTIOUS AGENTS FOUND IN BODILY FLUIDS.**
- **NITRILE GLOVES : ARE SUITABLE FOR THIS PURPOSE.**

PHYSICAL CAUSE OF OCCUPATIONAL SKIN DISORDERS

- **MECHANICAL TRAUMA: CALLUS ,CORN, LICHENFICATION**
- **PERMANENT CALLUS LEADING TO EARLY RETIREMENT**
- **CALLUS WITH PAINFUL FISSURE BECOME INFECTED**
- **PREVENTION : NOT NECESSARILLY**

HEAT

- **BURN ,MILIARIA, INTERTRIGO**
- **BURN: AFTER BURN HYPOPIGMENTATION SUSCEPTIBLE ACTINIC DAMAGE**
- **HYPERPIGMENTATION AND SCAR ARE DISFIGURING**
- **MILIRIA : SWEAT RETENTION**

  M.CRYSTALINA : UPPER EPIDERM

  M.RUBRA: LOWER EPIDERM

  M.PERFOUNDA: UPPER DERMIS


A.D.A.M.


heat rash

PREVENTION

- AVOIDING ACTIVITIES THAT INDUCE SWEATING
- USING AIR CONDITIONING TO COOL THE ENVIRONMENT
- WEARING LIGHT CLOTHING
- AVOIDING HOT AND HUMID WEATHER
- FREQUENT COOL SHOWERS OR COOL BATHS WITH MILD SOAP CAN HELP TO PREVENT HEAT RASH
- HEXACHLOROPHENE SOAP, FREQUENT CLOTHING CHANGES

CONTINUE

- **INTERTRIGO IS INFLAMMATION OF SKINFOLDS CAUSED BY SKIN-ON-SKIN FRICTION**
- **MACERATED, ERYTHEMATUS LESION IS MOST COMMONLY FOUND IN GROIN, AXILLAE, AND INFRAMAMMARY FOLDS. IT ALSO MAY AFFECT ANTECUBITAL FOSSAE; UMBILICAL, PERINEAL, OR INTERDIGITAL AREAS; NECK CREASES; AND FOLDS OF THE EYELIDS**
- **RESULT EXCESSIVE SWEATING IN OBESE WORKER**
- **INTERDIGITAL SPACE BETWEEN THIRD AND FOURTH FINGER**
- **BACTERIAL AND FUNGAL INFECTION IS COMMON**

COLD

- FROSBITE,CHILBLAIN
- FROSBITE: PROGRESSIVE VASOCONSTRICTION CAUSE IMPAIRMENT CIRCULATION
- CLINICAL SYMPTOM IN MILD FORM: REDNESS, TRANSIENT ANESTHESIA, SUPERFICIAL BULLAE →INITIAL REDNESS REPLACE BY WHITE WAXY APPEARANCE → BLISTERING & LATER NECROSIS

- LONG-TERM EFFECTS: RAYNAUD-LIKE CHANGE

  PARESTHESIA, HYPERHYDROSIS
- SCC DEVELOP IN OLD SCAR
- REWARMING, ANALGESIC, SURGICAL DEBRIDEMENT
- PREVENTION: PROTECTIVE CLOTHING, EDUCATING.

COLD

- CHILBLAIN: MILD FORM OF COLD INJURY
- REDDISH, BLUE, SWOLLEN, BOGGY DISCOLORATION WITH BULLA AND ULCERATION
- FINGER, TOE, HEEL,NOSE,EAR ARE EFFECTED
- GENETIC IS IMPORTANT BACK GROUND
- TREATMENT : SYMPTOMATICALLY

VIBRATION SYNDROME

- **VIBRATION TOOL IN COLD WEATHER PRODUCE VASOCOSTRICTION OF DIGITAL ARTERIES.(30-300)**
- **PALLOR, CYANOSIS, ERYTHEM OF FINGER NAMED RAYNAUD PHENOMEN**
- **PAPULAR NAME : DEAD OR WHITE FINGER.**

- TINGLING, NUMBNESS, BLANCHING OF THE TIP OF FINGER OCCURRED
- ASYMMETRY IS DIAGNOSTIC
- PREVENTION: DESIGNE OF TOOLS, INSULATION, PROTECTION OF HANDS FROM COLD WEAHTER.


With thanks