RN Cathy Hammond

Clinical Leader

Specialist Wound Management Service, Nurse Maude, Christchurch

Saturday, August 13, 2016 (Room 10)

16:30 - 17:30 WS #135: Wound Infection - What You Need to Know

Nurse Maude

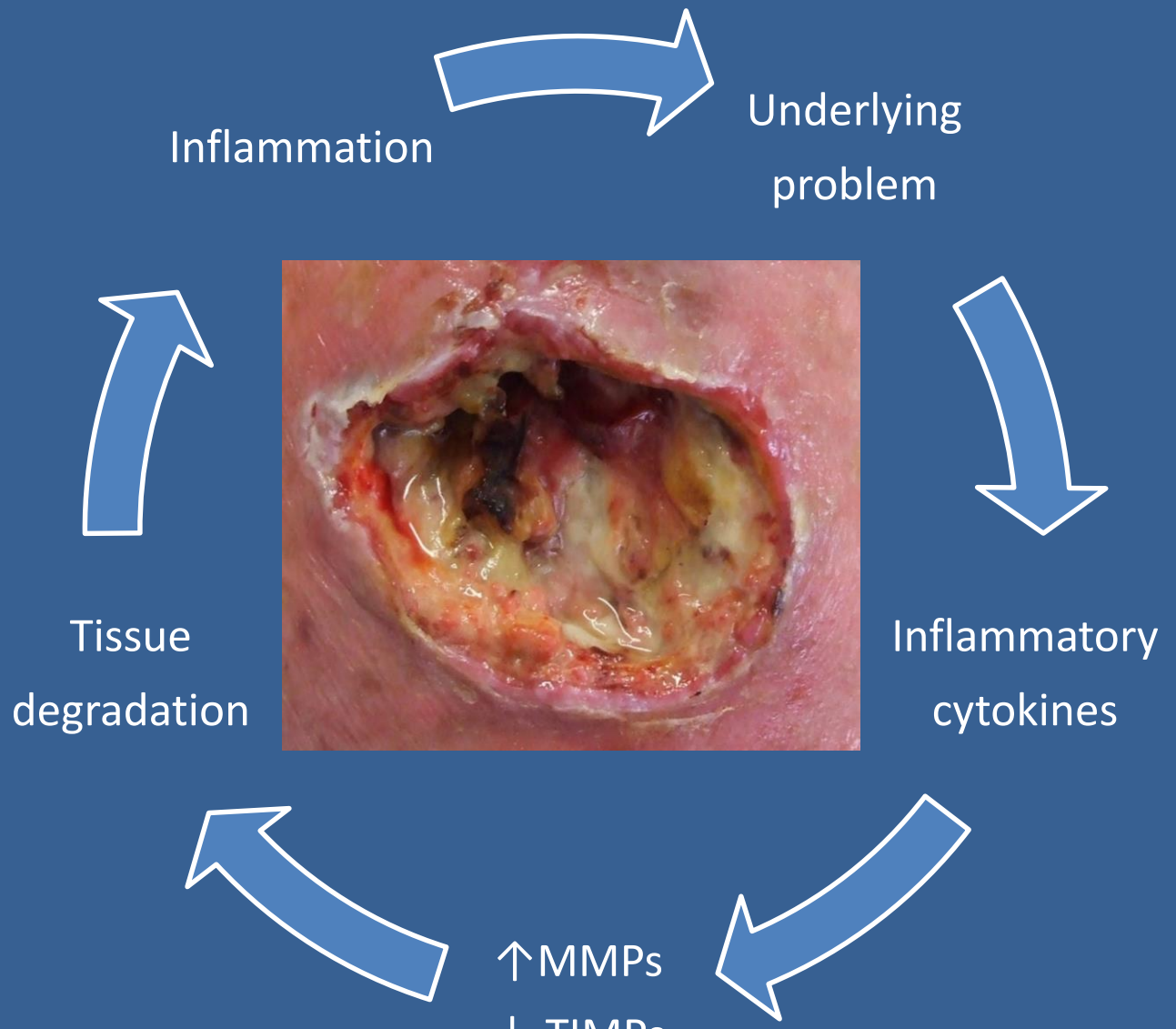
Wound Infections – what you need to know

2016

Catherine Hammond CNS/CNE

Leading the way in community care.

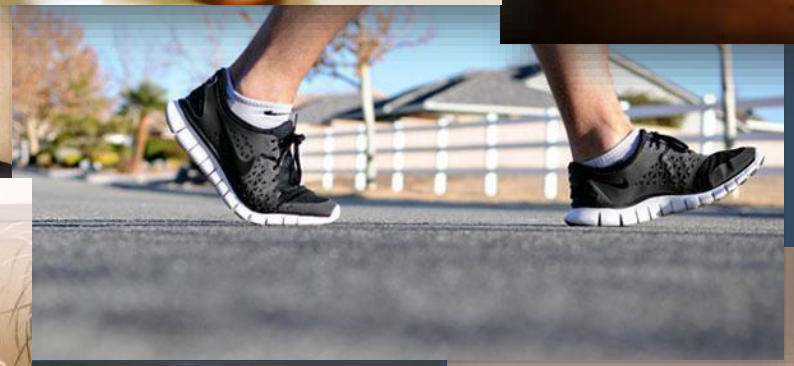

10
9
8
7
6


Inflammation
Underlying problem
Inflammatory cytokines
↑MMPs
↓ TIMPs
Tissue degradation

Treat underlying cause

- VLU – compression, elevation, exercise
- Ischaemia – revascularisation, exercise
- Skin tear – skin moisturizing, preventing falls, avoidance soap
- Neuropathic foot ulcers – pressure off-loading

Manage factors affecting healing



Prioritization

- Diabetic foot ulcers
- Ischaemia
- Gross leg oedema
- Immunosuppression
- Infection

Acute Wounds

Localised infection

- Classical signs and symptoms
  - New or ↑ pain
  - Erythema
  - Local warmth
  - Swelling
  - Purulent discharge
- Pyrexia (5-7 days post-op)
- Delayed healing
- Abscess
- Malodour

Spreading infection

As for localised infection PLUS

- Extension erythema
- Lymphangitis
- Crepitus in soft tissue
- Wound breakdown/dehiscence

Chronic Wounds

Localised infection

- New, ↑or altered pain
- Delayed healing
- Periwound oedema
- Bleeding or friable granulation tissue
- Malodour or change in odour
- Wound bed discolouration
- ↑ altered or purulent exudate
- Induration
- Pocketing or bridging

Spreading infection

As for localised infection PLUS

- Wound breakdown
- Erythema extending from edge
- Crepitus, warmth, induration or discolouration spreading into periwound
- Lymphangitis
- Malaise or other non-specific deterioration in general health

Taking a swab

- Prior to giving antibiotics
- Determine sensitivities and resistance
- May be inconclusive
- Correct method
- Provide information for microbiologist

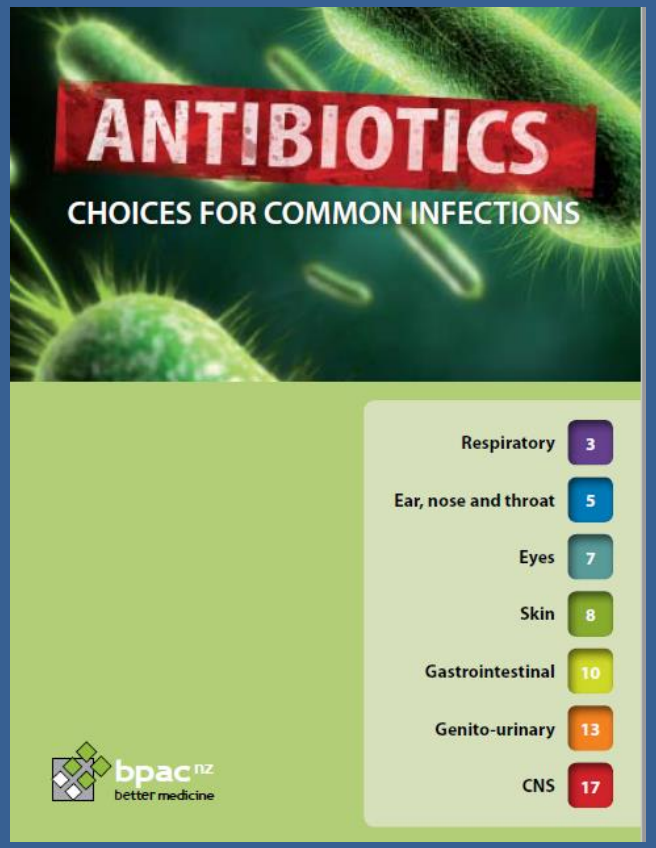
Most common pathogenic bacteria

- Staphylococcus aureus
- Pseudomonas aeruginosa

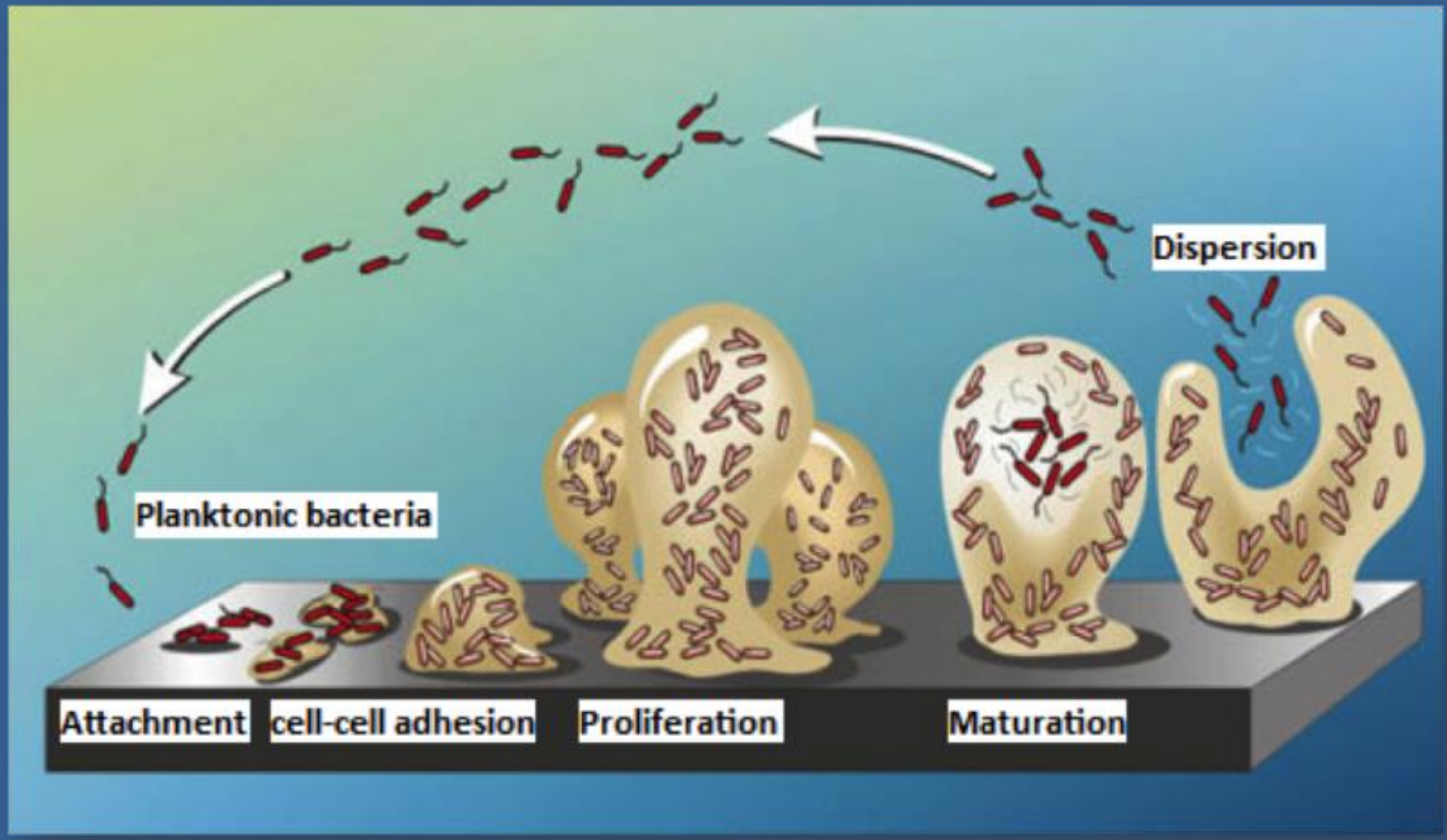

DARYL
CAGLE

Systemic infections

- Antibiotic choice
- Avoid topical antibiotics
- Local guidelines
- Patient advice



Biofilms

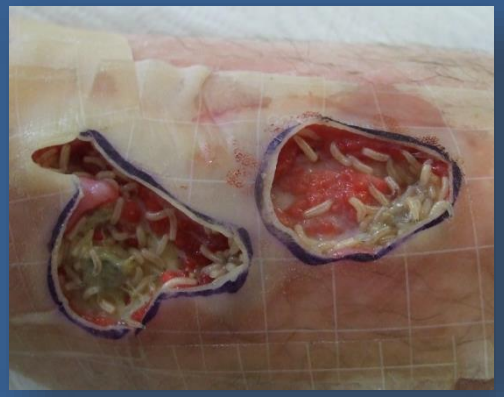

Dispersion
Planktonic bacteria
Attachment
cell-cell adhesion
Proliferation
Maturation

Biofilms

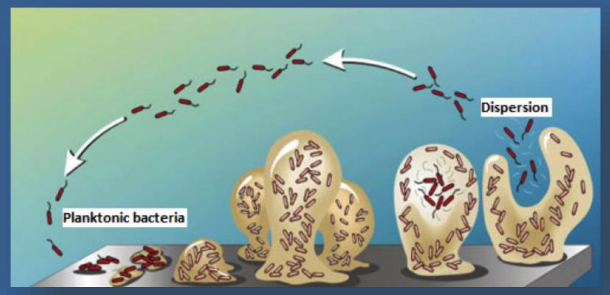
- Resistant to antibiotics, some antimicrobials
- Rapidly recover from mechanical disruption
- Reform within 24 hours mature 36 hours
- Stimulate inflammation, ↑ exudate, build up fibrin slough
- Bacteria in biofilms can hibernate

Debridement

- Vigorous physical cleansing
- Sharp debridement
- Larval therapy



Treatment of a biofilm



Broad spectrum antimicrobial

- Iodine
- Silver
- Honey
- PHMB
- Super oxidised solution
- Chlorhexidine

Should all wounds be treated with antimicrobials to prevent infection?

NO

Povidone Iodine

- Povidone iodine Betadine (short acting)
- Broad spectrum antimicrobial
- ↓ fibroblasts, keratinocytes, leukocytes
- Dry eg. Mummified necrotic wounds

- Precautions: pregnancy, babies and children, large wounds, impaired thyroid function, renal disease

Chlorhexidine

- Used commonly for handwashing and surgical scrub
- Broad spectrum
- Can be MRSA resistant
- Increased risk of sensitivity

Polyhexamethylene biguanide polyhexanide PHMB

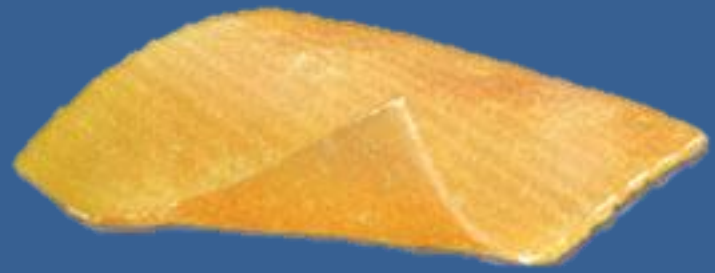
- Breaks down bacteria cell wall - kills bacteria
- Unlikely to cause resistance
- Irrigating solution, gel, impregnated dressings
- Low risk of toxicity
- Does not cause stinging
- No toxic effects reported
- Low risk of sensitivity

Super oxidised solution - Microdacyn

- Broad spectrum antimicrobial
- Denatures cell wall, ↑osmolality breaks cell wall
- Applied for 10 minutes as soak
- No evidence of resistance
- Low risk of toxicity
- Does not cause stinging
- No toxic effects reported
- Low risk of sensitivity

Honey

- Gamma irradiated
- Broad spectrum antimicrobial
- Acts through osmolality, acidity, hydrogen peroxide
- Low adherence to wound bed
- Cut to fit wound
- May cause stinging
- Can result in maceration



Silver products

- Broad spectrum bactericidal
- Anti-inflammatory
- Penetrates superficial tissue
- Do not use on non-viable tissue
- Appropriate use to reduce resistance

- Avoid in pregnancy, lactation, caution with MRI and radiation

Iodine

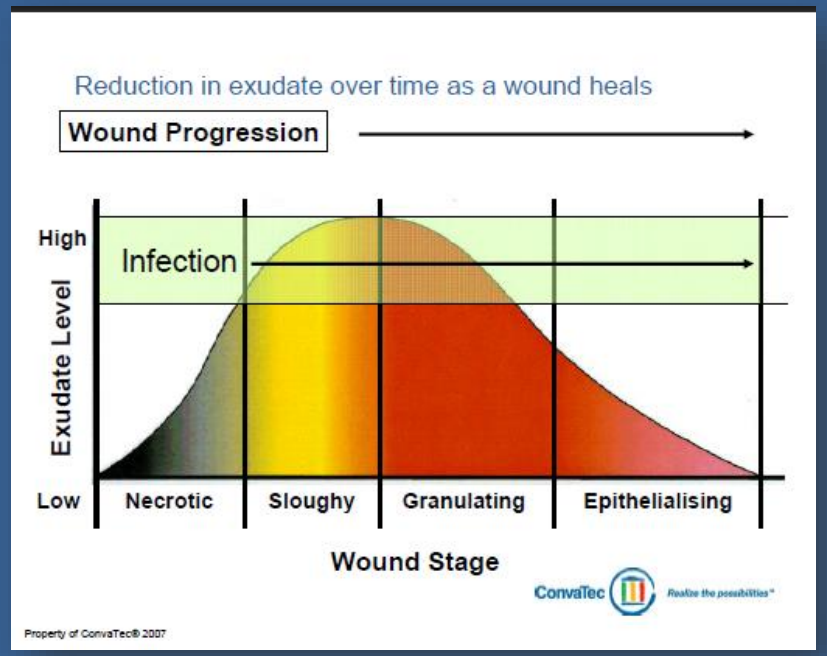
- Povidone iodine Betadine (short acting)
- Cadexomer iodine Iodosorb (sustained acting)
- Broad spectrum antimicrobial
- Cadexomer may penetrate biofilm

- Precautions: pregnancy, babies and children, large wounds, impaired thyroid function, renal disease

Dressing Considerations

- Semi-permeable backing
- Prevent strike through
- Control bacterial load
- Control odour
- Moist environment
- Wick away moisture
- Protect surrounding tissue
- Prevents trauma
- Conformable
- Comfortable
- Low or no toxic effects
- Cost effective
- Consider frequency of dressing change

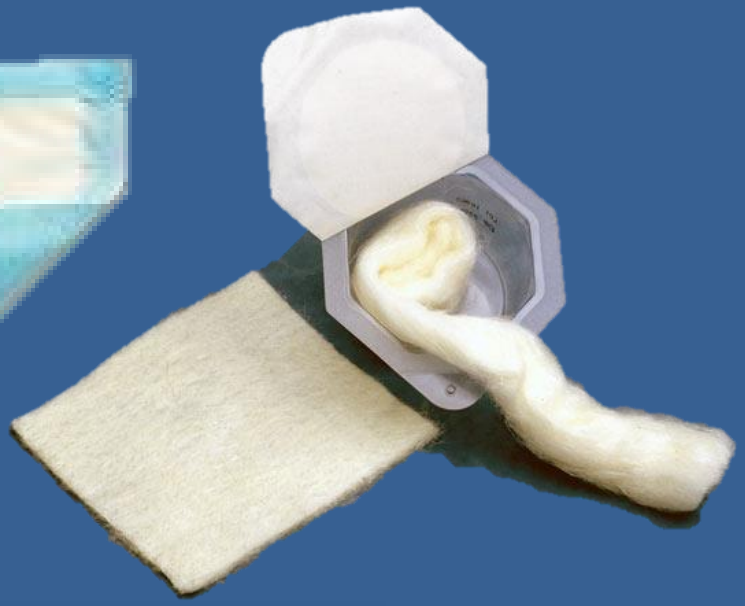
Preventing Maceration



Moisture Balance

- Control underlying cause eg heart failure
- Control bacterial burden
- Dressing products to wick exudate away
- Frequency of dressing change
- Protect surrounding skin

Secondary dressing choice



Protective Barrier Wipes/Remove Wipes

In conclusion

- Treat underlying conditions early
- Remove and control biofilms
- Consider frequency of dressing change
- Only use antibiotics when appropriate
- Discontinue use of topical antimicrobials when infection resolved
- Wounds should show signs of healing within 10-14 days
- Refer to Wound Specialist teams if not resolving

Prevention is better than cure

References

Bradbury, S, Fletcher, J. (2011) Prontosan made easy. Retrieved on June, 9 2016 at http://air-tite-shop.com/prontosan_made_easy.pdf

Gottrup, F. Apelquist, J. Bjanshott, T et al (2013). Antimicrobials and non-healing wounds. Evidence, controversies and suggestions. *Journal of Wound Care, 22*(5), S1

Hubner, N & Kramer, A. (2010). Review on the efficacy, safety and clinical applications of polihexanide, a modern wound antiseptic. *Skin Pharmacol Physiol 23, suppl 1, 17-27*

Phillips P, Yang Q, Davis S, Sampson C, Azeke J, Hamad, A & Shultz, G. (2013). Antimicrobial dressing efficacy against pseudomonas aeruginosa biofilm on porcine skin. *International Wound Journal, 12*(4), 469-483

International consensus (2012), Appropriate use of silver dressings in wound. An expert working group consensus. Wounds International.

Joanna Briggs Institute. (2013). Evidence summary: Wound infection: Iodophors and biofilms. *Wound Practice and Research,* 21(1), 12-13

Sauer, K., Thatcher, E., Northey, R. & Gutierrez, A. (2009). Neutral super-oxidised solutions are effective in killing P. aeruginosa biofilm. *Biofouling 25,(1), 45-54*

Principals of Best Practice: Wound Infection in Clinical Practice. An International Consensus. London: MEP Ltd. 2008.