

Scientific information on

Heart surgery

Causes of ischaemia:

Pre-operative

- Coronary heart disease/coronary infarction
- Increasingly advanced age of patients

Intra-operative

- Extracorporeal circulation with a heart-lung machine (Bypasses the heart and lungs, optionally brain)

➔ **Reduction of micro-circulation**

➔ **Increase of inflammatory parameters**

➔ **Hyperinflammation**

Risks after reperfusion:

- Damage to heart and lung tissue
- Hyperinflammation (= post reperfusion syndrome) leads to SIRS

➔ **Necrosis**

➔ **SIRS**

Conventional measures to prevent SIRS:

- Corticosteroids
- Heparin coated extra corporeal circulation systems
- Aprotinin (anti-coagulant, withdrawn from the market end of 2007)
- Leukocyte filters
- Intraoperative ultrafiltration

➔ **however, up to date no clear-cut proof of efficacy**

Data on selenium (selenite, some with selenase[®]):

- Coronary heart disease patients have low selenium levels [Altekin et al. *Journal of Trace Elements in Medicine and Biology* 2005; 18: 235-242]
- During extracorporeal circulation selenium levels fall by half within 30 minutes [Al-Bader et al. *Cardiovasc Surg.* 1998; 6(4): 406-414]
- Selenium status correlates with the duration of stay in ICU [Holzer et al. *Pediatr Cardiol* 2004; 25: 522-528]
- Selenium supplementation reduces ischaemia/reperfusion damage (animal model) [Turán et al. *Antioxidants & Redox Signaling* 2005; 7: 1388-1397]
- Selenium supplementation reduces mortality in SIRS/sepsis patients (SIC) [Angstwurm et al. *Crit Care Med* 2007; 35: 1-9]

Possible actions of selenium/selenase[®] supplementation:

- Maintenance of selenium levels during extracorporeal circulation
- Reduction of tissue damage in heart, lungs and brain
- Prevention or minimisation of systemic inflammation (SIRS)

Suggested timing and dosage for selenium supplementation:

Time point	Dosage
1 week pre-operative	500 µg Se/d as selenase [®] solution for injection
Bolus dose before defined ischaemia or reperfusion into priming volume of heart-lung machine	1000 µg Se/d as selenase [®] solution for injection

selenase®

a chance for your intensive care patients



selenase® –

- protects from endothelial, organ and reperfusion damage
- modulates inflammatory and coagulation pathways
- is very well tolerated



Why wait?

Abbreviated Prescribing Information

selenase® 100 micrograms, solution for injection (50 micrograms/ml)

selenase® 500 micrograms, solution for injection (50 micrograms/ml)

Active ingredient: sodium selenite pentahydrate. **Composition:** Each 2 ml ampoule/10 ml injection vial contains 100 micrograms/500 micrograms selenium as 333 micrograms/1.66mg sodium selenite pentahydrate ($\text{Na}_2\text{SeO}_3 \cdot 5\text{H}_2\text{O}$), corresponding to 50 micrograms/ml. **Excipients:** Sodium chloride, hydrochloric acid, Water for Injections. **Indication:** Proven selenium deficiency that cannot be offset from food sources. **Posology and Administration:** selenase® solution for injection is administered as an intramuscular or intravenous injection at a daily dose of 100 – 200 µg (1.27 – 2.53 µmol) selenium. If necessary, this dose can be increased to 500 µg (6.33 µmol) for a typical adult. No dosage adjustment is required for paediatric, renal or hepatic impairment patients. **Contraindications:** Selenosis. **Interactions:** Ensure that the pH value does not fall below 7.0 and that the solution is not mixed with reducing substances (e.g. vitamin C). **Pregnancy and Lactation:** There are no data from the use of selenase® in pregnant or lactating women. **Undesirable Effects:** None known to date when used as directed. **Overdose:** Counter measures include gastric lavage, forced diuresis, dialysis or administration of high doses of vitamin C. **Pharmaceutical Precautions:** Store below 25°C. **Legal Category:** POM. **Presentation:** Cartons containing 10 x 2ml ampoules / 10 x 10ml glass vials for single use. **MA Numbers:** PL 20437/0003, PL 20437/0004. **MA Holder:** biosyn Arzneimittel GmbH, Schorndorfer Str 32, D-70734 Fellbach, Germany. **Date of Preparation:** November 2004

selenase® corrects selenium deficiency



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We would be pleased to send you any further information.