



Emergency decompression in surface-oriented diving

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- A theoretical approach to DCS risk following emergency decompression
- A suggested emergency decompression procedure


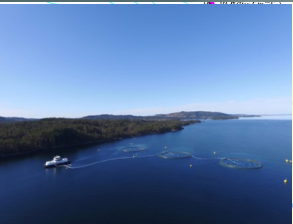

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The location

- Lokøyna, a fish farm in Fensfjorden, located approx. 50 km NNW of Bergen
 - 1 h driving distance
 - 15 min distance HEMS

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Worktask, organization, divespread

- Cage (exterior) inspection
 - Planned to take place from 27 m and gradually shallower
 - Planned as «no decompression» (no staged decompression) dive, i.e. max 25 min BT
 - SS air to KMB
 - 3 x 50 l 200 bar compressed air storage + 50 l backup.
 - 4-man dive team (Air supervisor, umbilical tender, standby diver, diver)
 - No DDC, standard first-aid equipment
- The diver
 - 23 years
 - Certified Norwegian Class B/IDSA Class 3
 - Approx 6 months work experience since graduation



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What if this had been a recreational dive

- Wouldn't the solution be obvious?
- However, simulating this dive on a ZHL-16 C with GF 100/100:
 - TDT 2:19
 - Probably a challenge unless properly thermally insulated, sufficient surface-supplied gas (or RB) and not injured or ill.



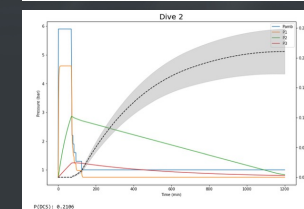
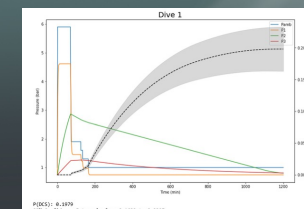
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What is the risk?

- Calculated based on an implementation of the NMRI 98 probabilistic model by Lyubisa Matitya
- Consider an air dive to 49 msw for 69 min decompressing
 - 9 msw/51 min, 6 msw/9 min and 3 msw/30 min.
 - **TDT 90 min**
 - PDCS=20% (95% CI=±3%)
 - 12 msw/5 min, 9 msw/5 min, 6 msw/10 min, 3 msw/30 min. **TDT 50 min.**
 - PDCS=21% (95% CI=±4%)



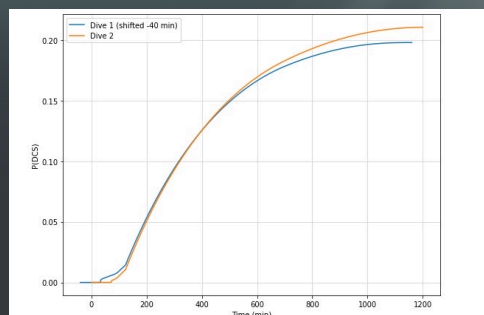
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What is the risk?

- Dive 1: TDT 90 min
- Dive 2: TDT 50 min



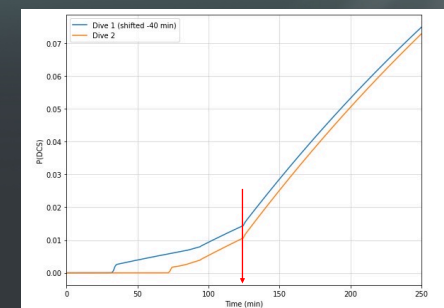
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What is the short-term risk?

- Dive 1: TDT 90 min
- Dive 2: TDT 50 min



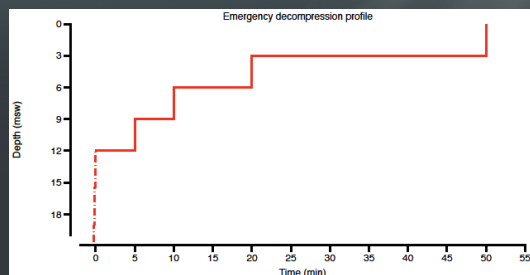
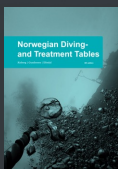
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Suggested emergency decompression procedure

Time (min)	Depth
5	12
5	9
10	6
30	3



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Our advice for use of the emergency decompression procedure (dives >>30 msw)

- Recompression chamber (RCC) on site (<10 min)
 - Recompress on site independent of omitted decompression
- Omitted decompression <30 min. Normobaric oxygen (O₂) available. RCC<1 h
 - Medevac to RCC
- Omitted decompression 30-60 min, O₂ not available and (or?) RCC>1 h
 - Emergency decompression
- Omitted decompression >60 min
 - Emergency decompression independent of O₂ if RCC>10 min.

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