

## REV37

### Auxetic biomedical designs

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**Introduction:** Auxetics are materials that exhibit a negative Poisson's ratio i.e. they expand when pulled apart. This makes auxetic materials are more resistant to fracture. Also auxetic materials do not dent easily – when compressed, the material compresses towards the point of impact and becomes much denser.

**Aim:** To assess the use of auxetic materials in biomedical applications in order to assess any benefits that could be accrued by the use of auxetic materials in biomedical research.

**Methodology:** A literature review in the medical and bio-industry fields was performed by using the terms 'auxetic', 'negative Poisson ratio' and 'zero Poisson ratio' using Medline, patent databases, Google and Google Scholar databases.

**Results:** A review of the literature identified several biomedical applications that are listed and discussed. There has been a yearly rise in patent number for biomedical inventions since Roderick Lakes first synthesized auxetics in 1987. They include applications like heart valves, annuloplasty rings, stents, arterial dilators, PTFE vascular grafts and other biomedical devices.

**Conclusion:** Auxetic biomedical designs are already used daily in biomedical applications. Their use imparts important behaviour like non-deformability, impact resistance, resistance to shear strain and curling with double curvature. Auxetic materials hold enormous promise and could soon, quite literally, be spreading everywhere.

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### Femoro-Acetabular Impingement (FAI) syndrome a fairly recent awareness and development. The medical imaging point of view

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Sports persons, physicians, orthopods and radiologists are becoming increasingly aware of the extra stress that is imposed on the hip joints with excessive activity particularly when superadded weight bearing and asymmetrical variations from the normal hip joint anatomy are present. Presentation of the abnormalities with the ball and socket areas of the hip joint and the various types of impingements: the predominant cam or the predominant pincer types and risk factors will be discussed in detail. The different kind of sportsperson types that are prone to FAI and the risk factors involved are presented. The two main methods of investigation: radiography and computerised tomography scanning techniques are elaborated and graphically projected. The radiological techniques and radiological signs of the disease entity will be slide depicted. Within the ball part of the hip joint: measurements of femoral head asphericity,  $\alpha$  angle and offset distance between the femoral head and neck will be discussed. With regard to the socket part of the hip joint: the acetabular version angle and the depth or shallowness of the acetabulum with their methods of quantification detailed. In conclusion, Femoro-Acetabular Impingement is a syndrome which is currently more appreciated within the sports medicine, orthopaedic and radiological fields and today various approaches to assessment have been divided with regard to how to diagnose and quantify abnormalities within both the ball and the socket regions of the hip joint.

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### The role of serum markers in predicting outcome of threatened miscarriage

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Miscarriage is the commonest pathology affecting human pregnancy. Clinically, miscarriage can be divided into a number of different types, but for the scope of this review, threatened miscarriage (TM) has been mainly considered. TM is a major complication of 1st trimester pregnancy characterised with the appearance of vaginal bleeding. In the UK alone, it is estimated that 100,000 –135,000 women annually will present with bleeding in the first trimester. This is associated with a number of adverse complications which include pre-eclampsia, and preterm labour with eventual foetal loss. Serum markers could serve as invaluable tools for the health professional to provide a diagnosis, prognosis and ultimately provide treatment pertinent to the outcome of pregnancy. A literature review was carried out to analyse the spectrum of possible biomarkers predicting the pregnancy outcome. Predictive biomarkers can be classified into three main groups: hormone-based markers, immune-based markers and miscellaneous.

## REV40

### On posting, blogging, tweeting and the Face/Tube... doctors and the social media

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The social media are a means by which an individual professional can leave a permanent mark on self, other, even the entire profession. It is not unusual for medical professionals and students to post inappropriate content online: photographs of patients, professionals/students exhibiting inappropriate behaviour such as substance misuse, alcohol intoxication, or sexually inappropriate content. In a single moment, the individual's reputation, and of the profession in general is tarnished, due to undermined trust in the profession. It is very easy to be disinhibited online when a computer will not give the cues a patient would give during a clinical assessment/interview in response to the doctor's words or actions. There is a higher frequency of social networking among younger professionals, as opposed to older professionals with more experience in the importance of professional boundaries. Disseminating information on social networks makes personal information public and this information may become 'viral.' It also causes difficulty in separating personal from professional life. Social networking can also provide personal information to individuals who may have wished to ask but never dared. Hackers could even override privacy settings. Online social interactions may also give rise to issues of employability. Another issue that has arisen has been the use of social media by pharmaceutical companies to promote a particular product and thus overcome possible negative issues concerning the product. However, social media can also be used as a means of quality improvement and some would argue that in this day and age, medical professionals need to have an online presence and that social media can be used to promote high health standards and for communication with other professional colleagues. An example of this has been the provision of real-time updates in the context of disaster medicine. One needs to avoid disclosure of personal information which would violate professional boundaries. It is important to educate juniors about these matters and to use social media as a way of educating both students and patients. In April 2012, the GMC has issued draft guidance on doctors' use of social media.